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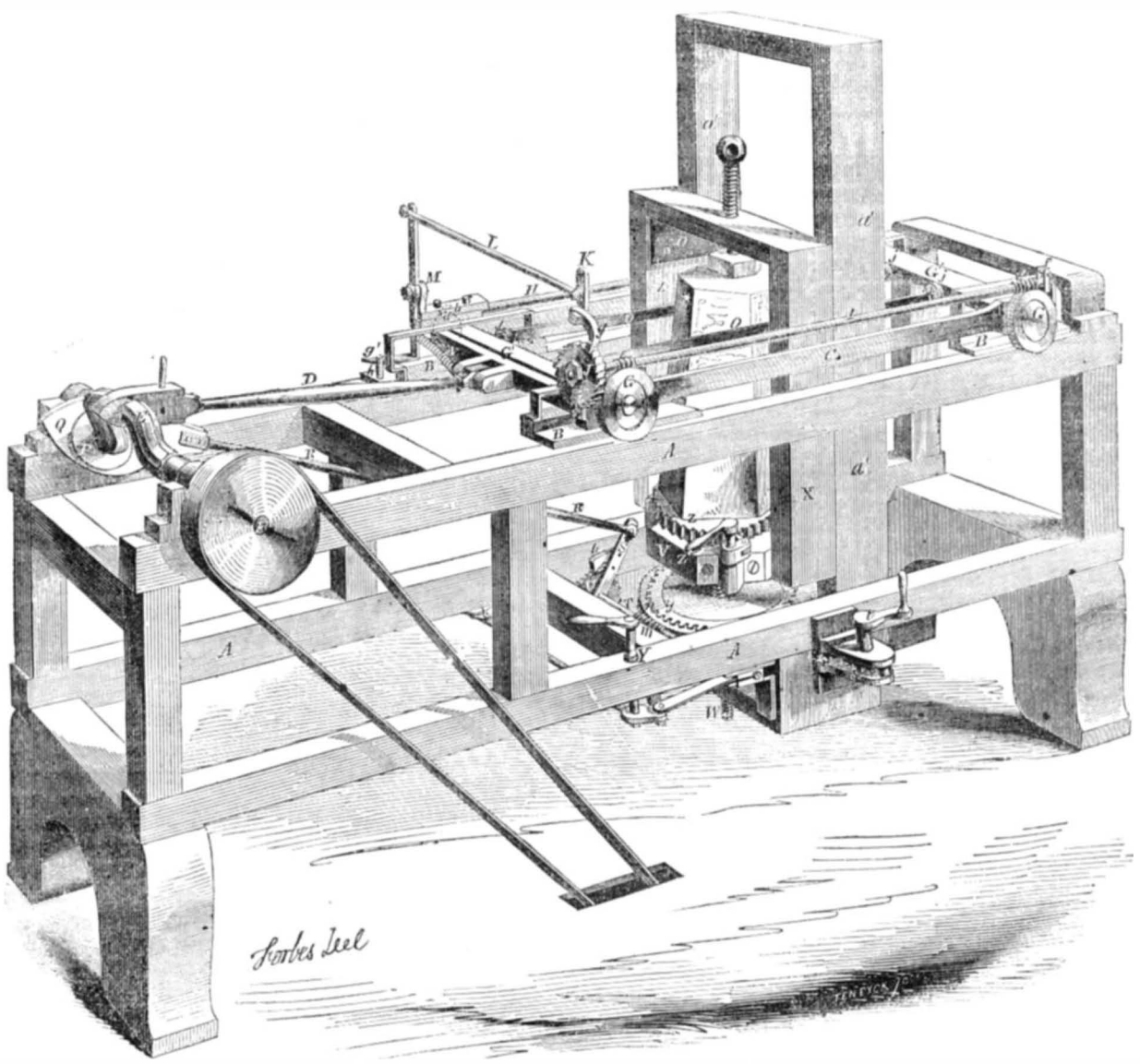
An Inch of Rain on the Atlantic.

We have been struck with that passage of Lieut. Maury's "Physical Geography of the Sea" in which he computes the effect of a single inch of rain falling upon the Atlantic Ocean. The Atlantic includes an area of 25 millions of square miles. Suppose an inch of rain to fall upon only one-fifth of this vast expanse. "It would weigh," says our author, "three hundred and sixty thousand millions of tuns; and the salt which, as water, it held in solution in the sea, and which, when that water was taken up as vapor, was left behind to disturb equilibrium, weighed sixteen millions more tuns, or nearly twice as much as all the ships in the world could carry at a cargo each. It might fall in a day; but occupy what time it might in falling, this rain is calculated to exert so much force—which is inconceivably great—in disturbing the equilibrium of the ocean. If all the water discharged by the Mississippi River during the year were taken up in one mighty measure, and cast into the ocean at one effort, it would not make a greater disturbance in the equilibrium of the sea than would the fall of rain supposed. And yet, so gentle are the operations of nature, that movements so vast are unperceived."

Marble Sawing Machine.

The annexed engraving illustrates a machine for the simultaneous sawing of two sides of a block of marble, the cuts being made straight, or on a taper, as may be desired. Much attention has been given to this particular subject of invention, during the past few months, in consequence of the offer of a prize of $10,000 for the best practical machine for the purpose.—In the last number of our paper we published a communication from the offerer of the prize, in which he makes some very interesting statements respecting the marble resources of this country, the extent and growth of the trade, the uses and value of this special class of machinery, &c. The engraving herewith presented is the first of the kind that has ever appeared in our columns. The invention originated with Messrs. Noette and Schmidt, 227 Front st., Brooklyn, N. Y., and was patented Nov. 20, 1855.

MACHINE FOR SAWING MONUMENTAL MARBLE.



A is the frame, on the upper part of which guides, B, are secured in which a horizontal saw frame, C G', works. This saw frame is operated by a pitman, D, operated by a crank, E, on shaft F. In the end pieces, G', of the frame there are rods, indicated by the worm wheels, G G, upon them; said rods have right and left screw threads cut upon them, the thread at one end of the rods being cut reverse to those on the opposite ends. The rods are operated by their worm wheels G G, into which screws, *e e*, gear, said screws being upon a shaft, I, which works in suitable bearings, *f*, attached to the saw frame. One end of the shaft, I, has a ratchet, J, into which pawl, *g*, catches, said pawl being attached to a lever, K. The upper end of the lever, K, is attached to rod L, and the rod, L, is attached to a lever, M. The lever, M, has a horizontal projection, *g'*, at its lower end, the outer end of which projection is rounded or beveled, as shown. A pin, *h*, is placed on the framing, A, against which pin the projection, *g'*, strikes. N is a spiral spring, one end of which is attached to the lever, M, and the opposite end to the saw frame, G'. O O are saws. The ends of these saws are attached to nuts, *j j'*, which work on the screw threads cut on the rods, G', before mentioned, there being a nut on each screw thread. The saws are not attached directly to the nuts, but to plates, *k*, which are secured to the ends of the nuts. By adjusting these plates to the nut in the desired position, the cutting edges of the saws, O O, may be inclined either outwards or inwards to suit the taper direction or form in which the block of marble is to sawed. To one end of the shaft, F, there is attached an eccentric, P, around which a strap, Q, is fitted, said strap being attached to a rod, R, the lower end of which is connected to a lever, S, which works loosely on a shaft, T.—This shaft, T, has a ratchet, U, at its end, and a pawl, *l*, attached to the lever, S, catches into the ratchet, U. The shaft, T, also has a screw, *m*, upon it, which screw gears into a worm wheel, *n*, which is fitted upon a screw rod, W. V is a bed, which has a frame, X, attached to it, said frame, X, being allowed to slide up and down, by means of guides, *o*, on uprights, *a' a'*, attached to the frame, A. To the upper surface of the worm wheel, *n*, a toothed wheel, *y*, is attached, and a toothed wheel, *r*, indistinctly shown, gears into the wheel, *y*, and a pinion, *s*, gears into the wheel, *r*. The axis of the pinion, *s*, has a crank, *t*, attached to it.—The bearings of the shaft, T, are allowed to slide in the frame, A, and levers, Y, are attached to said bearings, by operating which the screw, *m*, on the shaft, T, may be thrown in and out of gear with the worm wheel, *n*.—On the bed, V, is a ratchet wheel, Z, which is operated by means of the hand lever pawl, Z'.

The block of marble, *, to be sawed is placed upright on the wheel, Z, and secured in proper position by means of the screw rod at the top. The lower or cutting edges of the saws, O O, are then set outwards to correspond to the taper designed to be given the sides of the block. Motion is then given the driving shaft, F, by the belt, and a reciprocating motion is thus communicated to the saw frame by the pitman and crank. As the saws vibrate they cut the block of marble from its top end downwards, while at each stroke of the saw frame the screw rod worm wheels, G, are turned in consequence of the projection, *g'*, at the lower end of the lever, M, striking the pin, *h*; and the nuts, *j*, on the screw rods, will be thrown or moved further apart at every stroke of the saw frame, so that the block will be sawed in taper form, the diameter of the block increasing gradually from its upper to its lower end. The block is fed upward to the saws as the saws cut, by means of the worm wheel, *n*, which, as it turns, moves the screw rod, W, upward, which raises the block of marble. The worm wheel, *n*, is turned by the screw, *m*, on the shaft, T, the shaft being turned the requisite distance at each stroke of the saw frame, C, by means of the ratchet, U, pawl, *l*, rod, R, and eccentric, P, as as described. When two sides of the block are sawed, the block is run down again below the saws by turning the crank, *t*; the ratchet wheel, Z, on which the block rests, is now turned by means of the lever pawl, Z', and the block may be set to have two new sides cut. In this manner a square, hexagonal, or any many-sided form may be given the block. The degree of quickness of taper may be regulated by simply changing the fulcrum of the lever, M.

It is alleged that this machine will work rapidly and well, and that a block of any polygonal or many-sided form may be sawed without removing the block from the machine from the time it is commenced until it is finished. For further information respecting the invention address the patentees.

Curing Jaundice.

M. Bernard, a French chemist, has, it is said, demonstrated, by several experiments, that the white of eggs can only be assimilated or converted into food for the human body through the intervention of the liver. Guided by this fact, Dr. Giesler, of Goettingen, has suggested its employment in the treatment of jaundice. If the digestion of the albumen of eggs tend to rouse the action of the liver, it will necessarily restore the secretion of bile and cure jaundice.

Cowdee Gum and Varnish.

In New Zealand, a resin of a peculiar character oozes from the trunk of the *Pinus Kauri*, a noble tree, which oftentimes attains to a diameter of twelve feet. The resin is commonly called "Cowdee gum," and is found in pieces, from the size of a walnut to chunks weighing two hundred pounds. Some specimens are clear and white, and others are of a nut brown color. It is fragrant, like elimi, and as inflammable as camphor. It readily dissolves in alcohol, and makes a harder varnish than gum mastic. It also dissolves in alcohol mixed with turpentine, and mixed with lac, makes a good sealing wax. It is now extensively used for varnish in England, but is not yet much known in our country.

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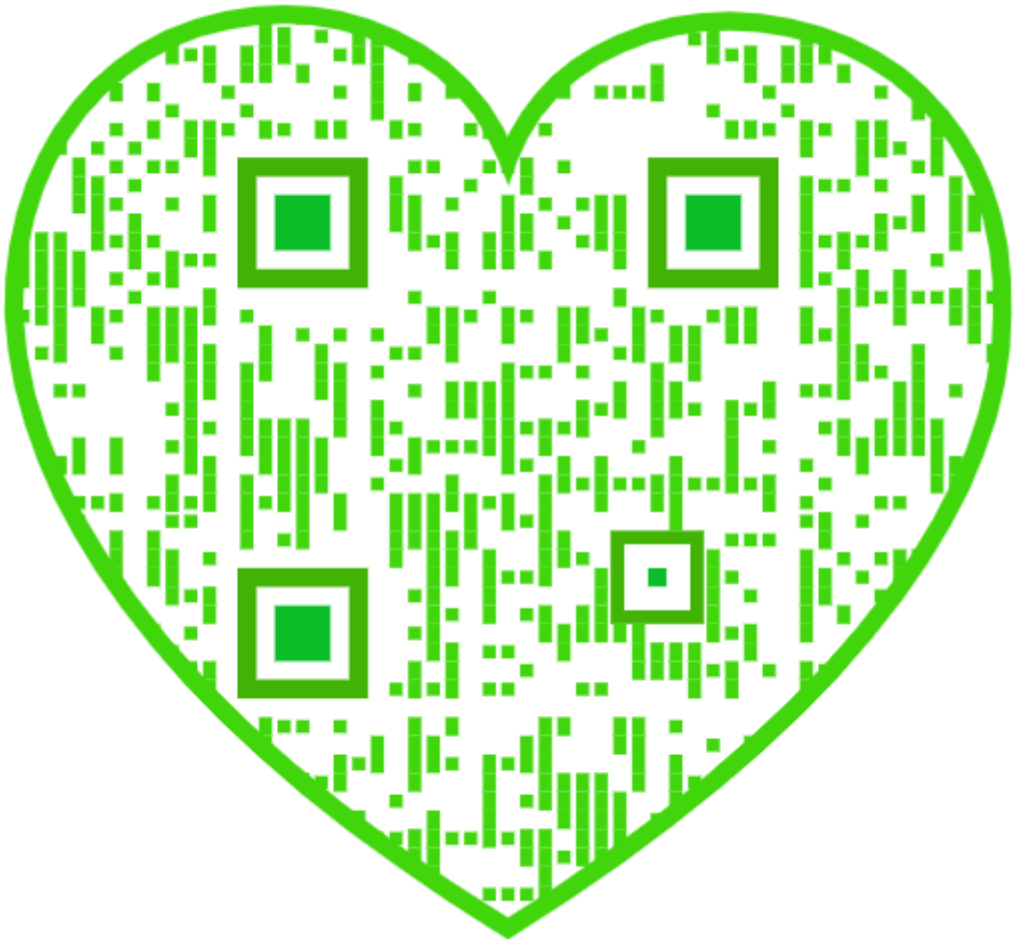

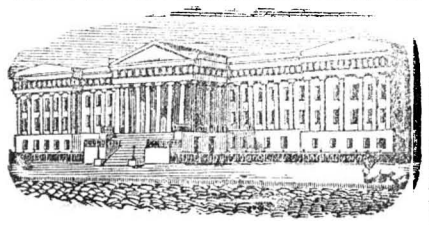

[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING JAN. 29, 1856.

OPERATING THE THROTTLE VALVE OF STEAM ENGINES—Albert Bisbee, of Chelsea, Mass.: I claim raising and lowering the vibrating toe, a, by means of the lever, f, operated by the governor, in the manner substantially as set forth.

SHOT POUCHES—J. T. Capewell, of Woodbury, Conn.: I do not claim the construction of the charger, D, fig. 3, as new, neither do I claim the main tube, as shown at A, fig. 1, and at E, fig. 2; nor yet the small tubes, a and g; I do not claim the ring, C, fig. 1; nor the spiral spring, s.

I claim my improvement in the construction of a cut-off having the lower edge or bottom straight: also having the vertical edges turned up, or over, for the purpose substantially as described, K, fig. 2.

I also claim the mode of fastening the rings around the main tube or throat of the shot pouch, in the manner substantially as described and shown at fig. 5.

FIELD FENCES—T. J. Carleton and Stephen Post, of York, Ohio: We claim a fence constructed of rails, secured to each other and supported at proper distances above the ground by posts composed of iron rods twisted alternately round each other and round the rails, as described, and one or both of the rods bent down from the top of the fence, to brace it, as specified, to the base in which the rods are fixed.

LOCOMOTIVE FURNACE GRATES—G. R. Comstock, of Manheim, N. Y.: I am aware that grate frames with numerous vertically moving fingers to stir and clean the fires of locomotives, have been used by Nichols & Boyes, as shown in their patent of 1850; I therefore make no claim to the device of the moving grate; neither do I claim, of themselves, the eccentrics or rods by which the slides are moved.

I claim the simultaneous raising of the grate, B, and opening of pipes, F and G, at will, for aiding the combustion of fuel in the furnace during the running of the engine, by the combination of reciprocating plates. C C', and stop rods, i, and parts connected therewith, or devices equivalent thereto.

REPLACING RAILROAD CARS—H. N. Degraw, of Piermont, N. Y.: I do not claim any of the devices, separately considered, making up the combination.

But I claim the combination of the self-adjusting packing wedge, D, attached to an elastic or yielding rod, C, with the bars, B and A, operating levers, I K, and griping jaws, F F, constructed and arranged for operation together, in such a manner, that while upon the depression of the hand lever, which effects the movement of the car or locomotive wheel. the griping jaws are made to firmly grasp the rail, to secure a steady fulcrum for the operation of the lever; the packing wedge follows up the movement of the wheel to retain it in the place to which it has been moved, and upon raising the hand lever, the griping jaws are released, and the whole implement may be run forward on the rail for a further joint action of the self-adjusting wedge and gripe of the jaws as a prop to follow up the work, repeatedly and progressively, as set forth.

BRICK MACHINES—L. T. Delassize, of New Orleans, La.: I claim the combination of the sectional pinion, L, and spring toothed crane, M, with the rock shaft, E, and pressing rods, i J, arranged and operating substantially as and for the purpose set forth.

SCAFFOLDS—Chas. Foster, of Philadelphia, Pa.: I do not claim separately either of the several devices constituting the scaffold described.

But I claim a scaffold consisting of the combination of the adjustable uprights, A A A, the movable brackets, B B, for supporting the foot boards; and the horizontal adjustable ties, D D, the same being arranged, combined together and operating, as described, and also held or secured in a perfectly steady position, near the building which is to be repaired or painted, without direct contact with the wall of the same, by means of the jacks, E E, and the braces, F F, constructed, applied, and operating, substantially as set forth.

TELEGRAPHIC REGISTERS—M. G. Farmer, of Salem, Mass.; I am aware that a telegraphic repeater, operating upon the same general principle of mine, has been invented at an earlier date, by Elisha Wilson, of New Haven, Conn.: in his machine, however, the local circuits are both closed, when the main circuits are both closed; while in mine, the local circuits are similarly both open, when the main circuits are both closed, the same work, which, in Wilson's machine, is done by the closing of the local circuit is done in mine, by the opening of the local circuit, and vice versa. The general plan, therefore, in which my machine agrees with Wilson's, I do not claim; neither do I claim simply substituting the breaking of the circuit for the closing to do the same work.

But I claim that modified combination of parts, by which, in the self-acting telegraphic repeater, as described, the breaking instead of the closing of the local circuit is made to close the main circuit, and by which, throughout the breaking of the local circuit is made a substitute for the closing.

HEATING BUILDINGS BY STEAM—S. J. Gold, of New Haven, Conn.: I claim the automatic governing of the draft, and the shutting off of the same, by the forcing of water from the boiler, by pressure of steam, under the circumstances and substantially as specified, or, in other words, establishing the hydraulic seat.

I also claim the automatic government of the valve, a, by the forcing of water from the boiler, by pressure of steam, under the circumstances, and substantially as set forth. The governing of draft valves, by expansion of water, being expressly disclaimed, as constituting no part of my invention.

UNIVERSAL JOINT FOR CONNECTING SHAFTS, &C.—Jonas Hinkley, of Huron, Ohio: I claim, connecting shafts, when placed angularly with each other, by means of the universal joints, constructed as shown and described, by which a rotary motion may be communicated from one shaft to the other.

MORTISING TOOL.—Hazard Knowles, of New York City; I do not claim, broadly, an instrument with teeth upon one or both edges; nor to the making of an instrument with teeth along the edge or edges, on a line inclined to the line of motion of such instrument.

But I claim combining in one instrument a series of chisels, of the width required to give the desired form to the wood to be cut, when the said chisels are arranged in succession, on a line oblique to the line of motion of the entire series, and with gullets interposed to receive and hold the wood cut by each chisel, until it passes through the thickness of the material to be cut, substantially as described, by which combination and arrangement the desired form is given at one operation, by the breadth of the chisels, and by the inclination of the series to the line of motion of the cutting edge, as set forth.

I also claim the employment of an instrument, composed of the combined series of chisels, arranged substantially as specified, in combination with the jaws on which the wood to be mortised is placed, which jaws are to be set or adjusted, relatively to the line of motion of the said instrument, and the inclination of the series of chisels, as to sustain the under surface of the wood, outside of the form intended to be cut, and to act as resisting shears, in conjunction with the chisels which finish the cutting of the desired form, substantially as described.

STENCILING WINDOW SHADES—Daniel Lloyd, of New York City: I claim, first, producing patterns on window shades, in which long or continuous lines form a prominent feature. by means of pairs of stencils, of the full size of the design, prepared in the manner set forth.

Second, the mode of registering the stencils, by use of the movable piece, c, in combination with the fixed stops, b, or their equivalent, for the purpose of readily adapting the stencils to shades of various widths, as specified.

PILL MAKING—N. W. Kumler, of Cincinnati, Ohio: I claim the combination of the adjustable plates, 7 and 8, apron, 2, pulley, 1, and drum, 3, and these, in combination with the grooved roller, 12, and segmental plate, 14, all substantially as and for the purposes set forth and represented.

MASTIC FOR COVERING WALLS—A. C. Moestue, of Kane Co., Ill.: I do not claim the application of an alkaline rosin solution; nor do I claim the sprinkling of pulverized substances on painted surfaces; and do not confine myself to any peculiar mode of coating the surface with rosin.

But I claim the glazing of surfaces previously coated with rosin, or its equivalent, by a naked flame, in the manner and for the purposes described.

GRINDING MILLS—Lucius Paige, of Cavendish, Vt.: I claim arranging and combining with a screw, in manner substantially as described, one or more wheels and a hopper, whereby such mechanism is made to answer the purpose of a mill for grinding.

CUTTING FLOCKS AND PAPER STOCK—J. N. Pitts, of Blackstone, Mass.: I claim the combination of the cylinders, F F, provided with spiral knives, f, cutters, I I, attached to the adjustable and elastic or yielding bars, G G, and the drum, B, the parts being arranged as shown, for the purpose specified.

PUNCHING MACHINE—Rufus Porter, of Washington, D. C.: I claim the use of the double quadrant, J J, in combination with the tappet, S, the sliding shaft, I, when their several parts, are arranged and operated in connection with the fly wheel, G, substantially in the manner set forth.

HINGE—G. M. Ramsay, of New York City: I claim the anti-friction rollers, A, in combination with a joint hinge, substantially in the manner and for the purposes set forth.

BEE HIVES—H. G. Robertson, of Greenville, Tenn.: I do not claim lime, as a material for packing the joints of my hive, but merely indicate it as the most suitable for that purpose, among several materials offensive to insects, which I know of, that could be used with more or less advantage: I claim making the joints hollow, and stuffing them with caustic lime, or other matter offensive to insects in the manner and for the purpose specified.

CLEARING SNOW FROM RAILROAD TRACKS—Riley Root and S. G. Holyoke, of Galesburg, Ill.: We do not claim a revolving track clearer, driven by the running gear of the locomotive, as we are aware that various forms of such have been proposed.

But we claim the arrangement of a rotary fan blower, provided with knives, and made sufficiently large to sweep the entire width of the tracks. The said rotary blower is to be driven by a power independent of the locomotive wheels, and is capable of being revolved in either direction, at right angles to the direction of the track.

SCREW JACKS—H. F. Shaw, of South Boston, Mass.: I claim the described screw jack, consisting essentially of the screw, C, plates, E, and double pawls, g, operating in the manner, substantially as set forth.

CHIMNEY COWLS—C. F. Thomas, of Taunton, Mass.: I do not claim a turning cowl applied to the top of a chimney, or flue, and having a wind vane attached to it.

But I claim arranging the vane, so that it shall extend directly across the discharging aperture of the cowl or ventilator, and divide such aperture, in manner and for the purpose, as explained.

I also claim constructing the vane of two wings flaring from one another, as they extend from the cowl, as specified, the same being for the object or objects, as stated.

I also claim arranging each of the wings so that it shall extend down below the discharging apertures of the cowl, and from and around the external surface of the cowl, substantially as described.

ATTACHING TEETH TO SAW PLATES—P. B. Tyler, of Springfield, Mass.: I claim, first, the hardened nib holders, attached to the saw plate at each tooth, to hold a small cutting nib, as described.

Second, I also claim the cutting nibs attached to the saw teeth, whether by means of the nib holder, or directly connected with the plate, constructed and combined with the saw, specifically as specified.

DEVICE IN TREE-NAIL MACHINES—Elbridge Webber' of Gardiner, Me.; Disclaiming the traversing of the forming box over the tree-nail, and the alteration of the size of the tree-nail, by the expansion and contraction of the cutter box, broadly considered.

I claim, in tree-nail machines, the construction of the traversing forming box of a flaring mouthed bit holder, combined with a slide, g, whose upper surface composes so much of the form box opening, as lies below the plane of the bit seat produced, perpendicular to which plane, said slide is adjustable, for changing the size of the tree-nail, the operation being as set forth.

BUGGY WAGONS—Thos. Winans, of Baltimore, Md.: I claim the combination of bent bars and springs, arranged substantially as described, to connect the fore and hind axles, support the seat, with both the requisite firmness and elasticity, and to permit the front wheels to pass under the seat in turning short round.

BELT AND BAND FASTENINGS—Geo. D. Young, of Plymouth, Mass.: I claim a clasp for uniting the ends of a belt or band consisting of the bottom plate, with its vertical studs and the turning button or its equivalent, all operating together, to rigidly gripe the belt or band, as described.

SOLDERING IRON—Daniel Dod, (assignor to himself and Henry F. Read,) of Brooklyn, N. Y.: I do not claim the iron handle or copper bit, nor any particular external form of soldering irons, nor the general application of heated centers, as used in embossing irons or rollers, crimping irons, curling tongs, and hatters' irons, as they have been known and used previous to my invention.

But I claim the combination of a hollow bit of copper, with movable centers of iron in the construction of soldering irons, as described.

CUTTING MOLDINGS ON MARBLE—Hiram L. Houghton. (assignor to Abel H. Grennell,) of Springfield, Vt.: I do not claim the rectilinear moldings upon marble by the use of revolving disks or grinders, that having been known before.

But I claim the method of cutting moldings upon the edges of blocks by the employment of the disks, K' K', or e e', and the adjustable table top, B, operating in the manner and for the purpose set forth.

CELL LOCK—Edward Kershaw, (assignor to himself and Henry M. Hooper, & Co.) of Boston, Mass.: I do not claim the invention of a single locking bar or bolt so made and applied to the wall above the door openings of a series of prison cells as to be capable, by its longitudinal movement, of either locking or unlocking, simultaneously, all the doors of said cells.

But I claim the combination of the bars, E and H, having notches at certain proportioned distances, as described, operating in connection with the studs, D, on the cell door, in the manner set forth.

FLOURING MILLS—Joseph Weis, of Bordentown, N. J.: I claim the longitudinal grooves, i, between the dovetailed steel pieces, constructed and arranged in the manner set forth, and for the purpose specified.

RE-ISSUES.

GRINDING MILLS—Amory Felton, of Troy, N. Y. Patented originally Jan. 2, 1855: I claim, first, in combination with the cylinder and concave. the cap, H, provided with spiral ribs on its under side for carrying forward the ground material towards the discharge end, and thus to make room for that which follows, and prevent clogging or choking, substantially as described.

I also claim, in combination with the cylinder, concave and cap, the fingers, e, for agitating the material, and causing it to pass more readily in between the cylinder and concave, substantially as described.

HARVESTING MACHINES—John Reily, of Hart Prairie, Wis. Patented originally Nov. 20, 1855: I claim, first, the retracting divider, substantially as described.

Second, the grain guard, substantially as described.

Somewhat of a Jumper.

John Lawrence Bagler, in the Louisville *Times*, offers to bet from $3000 to $5000 that he can jump, on a dead level, one foot further than any man in the world, or that he can stand flat-footed upon the earth and leap a brick wall fifteen feet high and four feet thick.

Our Foreign Correspondence.

LONDON, Jan. 12, 1856.

MESSRS. EDITORS—I enclose you a section of Dunn's Patent Duplicate Retort Boiler, which is of simple construction, and, as shown by experiment, of great strength. The objects sought by the patentee are to render explosions more difficult, and if an explosion does take place, to diminish its mischevious effects by giving it a more partial character. Mr. Dunn substitutes for the present steam boiler, cylinders or retorts about ten feet long and nineteen inches in diameter, of best 1-4 inch Staffordshire plate, with strong cast-iron ends, forming the pipe junctions. The cylinders are placed in parallel lines, and the water supply pipe is connected with one end of each by a short neck, through which the water is pumped into all the cylinders, which are generally kept about half full. In the event of an explosion, only one cylinder is likely to be affected. If the action of the fire is excessive upon some of the cylinders, their relative position can be quickly altered, or the cylinders themselves may be turned over. The cylinders being small are easily transported from place to place. At an experiment, alluded by the chief engineer of Manchester and the neighborhood as Mr. Dunn's works, one of these retort boilers was lately tested by hydraulic pressure, and burst at a pressure of 525 lbs. to the square inch. These boilers being made in parts, all of which are duplicates, any portion can be replaced at any time, or the whole enlarged, by placing more cylinders side by side. The large heating surface renders these boilers very economical on the score of fuel. The inventor is well known in the engineering trade here.

For some years a weekly journal which should thoroughly represent the interests of the engineers of this country has been thought a desideratum. From the date (1843) of the establishment of the *Artizan*—favorably known to most of your readers by your occasional extracts—many times has the chick been all but breaking the shell, but always has some untoward event occurred to crush it before development. On January 5th, however, two journals appeared, appealing to the sympathies of engineers and scientific men generally—the *Engineer*, and the *Engineering Journal*. The former of these comprises about sixteen pages of the size of the SCIENTIFIC AMERICAN; the latter sixteen pages, somewhat smaller. There are many points of similarity in their contents. But what strikes the English readers of your valuable periodical the most, is the use they make of the SCIENTIFIC AMERICAN—a great testimony, however, to the value of that journal. For example, the *Engineer* has, at page 12, reproduced the elaborate perspective elevation and plan of an improved ship windlass, which was patented by J. Emerson, of Worcester, Mass., and illustrated in the SCIENTIFIC AMERICAN some little time since. The same journal has re-produced (page 13) a punching and shearing machine, and Stoddard's hand corn planter, both without acknowledgment, from some of your recent numbers. By a singular coincidence the *Engineering Journal* also gives the punching and shearing machine, for which it says it is indebted to the Scientific Americans—a high compliment to the nation at the expense of your journal. I might be uncharitable enough to assume this to be an ingenious evasion of the moral obligation to acknowledge borrowed articles did I not find at other pages your title properly given at the end of extracts. The number abounds in typographical errors; perhaps the fault may be due to the printer's "devil," after all, for in the address we are told that "a first number is, at best, necessarily a rough proof." I will not, under the circumstances, attempt to criticise these "rough proofs," but they must materially improve the quality of their matter if they wish to receive the support and assistance of the practical workmen in the engineering trade. While there is much in each that will be found useful, yet neither has at present shown that tone of practicability which is necessary to secure a large circulation in the shop.

The daily prints inform us that on and after May next fifteen large mail steamers will leave Europe monthly for the American continent, viz.: seven English packets, four United States, three Belgian, and one Portuguese. Fourteen of these will start from or touch at England, the Portuguese packet being the single exception; eight of these fourteen steamers will start from Southampton, and the remaining six from Liverpool. These mail packets will cross the Atlantic by three different routes, which will terminate on the American side at the Brazils, Central America, and the United States. Rio de Janeiro will be the most southern point touched by them, and Halifax, Nova Scotia, the most northern point. In connection with these Atlantic packet lines there will be nearly twenty tributary ones, some of them as long as the Atlantic lines themselves. By these, the whole of the American Continent, down so far south as the river Plate on the eastern side, and from Peru to California in the Pacific, also the whole of the adjacent islands, including those of the West Indies, will be supplied with European correspondence.

Coffee, its Cost and Culture.

It is believed by many that coffee can be cultivated in some of our Southern States as successfully as in Brazil, Java, and Jamaica; if so, it is high time that some of our planters were entering upon its culture, as it costs our countyr no less than $15,500,000 annually for the beans of this plant.

The coffee tree lives to a great age provided that the land is kept well drained. The tree begins to bear when three years old, and is at its full bearing when seven years old. The tree is allowed to grow in hight from six to seven feet; the top branches are pruned off when the tree is five years old, so that by the time it is seven it resembles a spread umbrella. Each branch droops downwards, and thus gives the pickers a good chance to pick the berry. The coffee tree in Brazil bears two crops each year, the large crop in the spring, and the small one in the fall. The first crop is picked when the berry is red, resembling a cherry. The second crop is in general small, and allowed to remain on the tree until fully ripe and dry. This crop, cured in the husk, is far superior in quality, and is called "pearl coffee" The blossom is beautiful, small, and tender. It remains on the tree from three to four days. If the weather is warm, with showers, during those few days, the crop is sure; if cool at nights, it often fails. When the berry is taken home from the field it is carried to a mill-house. The mill consists of three small rollers. The berry is put into a hopper, and a constant stream of water falls on the rollers during the time the mill is at work. By this process the outside hull is taken off and the berry is separated from it, and the coffee falls into a brick tank, where it is washed perfectly clean, and then put on a place covered with tile or brick raised in the center that the water may drain. It is then taken to the curing loft, where it is turned four times a day until the hull is crisp and dry. Then by putting it through large fanners the inside hull comes off, and leaves the berry ready for hand-picking for market.

Sulphate of Indigo in Dyeing.

MESSRS. EDITORS—In your notices of foreign inventions three weeks ago, in speaking of permanent black, you allude to the "sulphate of indigo" as being used in fugitive colors. Sulphate of indigo cannot, strictly speaking, be termed a fugitive dye. In connection with the by-chromate of potash. I have used it very successfully in the dye house in coloring blues and greens, using the bi-chromate as mordant, and though not altogether equal to the blue vat, it is a mode far superior to the ordinary method of using the sulphate. T. STIBBS, A.M.

Wooster, O., Jan. 1856. Dyer.

New Method of Churning Milk.

E. Conkling, of Cincinnati, suggests to us an improved method of churning to obtain butter from the milk when it is sweet. The process is, to force the milk in small streams through orifices, such as a perforated plate or board, with a pump. He has tried a number of experiments and met with gratifying success.

American Plows in Malta.

Light American plows have superseded the heavy Scotch plows in Malta. They were in troduced recently by the Governor, Sir Wm. Reid, formerly of Bermuda. The Scotch plow was too heavy for the warm climate and the mules of Malta.

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[For the Scientific American.]

Why the Cornish Engine is Superior to the Common Condensing One.

H. Haines, your Virginia correspondent, asks on page 47, this Vol. SCIENTIFIC AMERICAN, to ascertain the cause of the superiority, if any existed, in the Cornish engine over the other, provided they operated under similar circumstances. I think that will depend very much upon their construction, and the skillful care devoted to their attendance.

A badly constructed and attended Cornish engine would but poorly compare with a good ordinary condensing one, and, on the other hand, a badly constructed and attended ordinary condensing engine would compare still worse with a good Cornish. A Cornish engine is nothing more than a condensing engine with all the improvements added to it, to adapt it to desired purposes. These purposes vary, and it may not be out of place here to state them:—For draining mines the Cornish engine, proper, is used, in which the piston is attached to the pump rods through the medium of an over-head beam; there is no rotative motion, the piston is attached to one end of the beam by piston rod and parallel motion links, and the pump rods to the other end direct.

The Direct Action, or "Bull Engine," in which the piston rod passes directly downward through the cylinder bottom, and is attached directly to the pump rods.

The Plunger Lift or "Water Works" engine, which is the same as the Cornish engine, proper, except that a plunger pump takes the place of pump rods and drawing lift fixtures; and the hoisting or rotative engine, which condenses its steam or not, and is generally provided with a beam.

The name "Cornish engine" may apply to any one of these, but no one knows which one is meant until it is specified; they all possess Cornish peculiarities, and generally not only Cornish but world-wide superiority.

The ordinary double-acting condensing engine has not, and never will equal, much less excel any of the single-acting non-rotative engines just mentioned, when applied to the same purposes—that of pumping water—for reasons which can be readily set forth in detail, but which, in the main, may be stated thus:—It is not in the nature of things for a complication of heavy machinery laboring under indirect application of the prime motor, to compete with the direct-action principle.

But H. H. wants to know the cause of difference in action and economy in the ordinary condensing engine and the Cornish engine, having the same sized cylinders, and operating under the same circumstances. We suppose that the first is one of our best maker's, and the other a good Cornish engine from the "land of its birth," or by a regular Cornish engineer. In this view of the case the Cornish engine will excel in the smoothness and gracefulness of its operation, as well as in its superior economy. The reasons are these:—The beauty and excellence of any machine will much depend upon the perfection of its details, and the intelligent care with which it is maintained in good working order.

You will quickly infer, then, that the Cornish engine is more perfect in its details; just so; and this virtue was brought into the mechanical world by the "mother of invention," and nurtured into important growth by a system of registration and encouragement held out by premiums, which have afforded the greatest scope for ingenuity in the improvement of the steam engine, as applied to manufacturing purposes as well as to the draining of mines. But what are these details, and how do they differ from those of our engines?

The valves are better, and work with more ease, and are less liable to derangement and leak. They are the Cornish double-beat balanced valve, a kind just beginning to be appreciated by our makers of rotative engines. The gear for working the valves is lighter, and in consequence keeps in good order longer, and works quite differently from the common eccentric hook, rock shaft, and lifter motions, getting rid of a great deal of friction. The adjusting and performance of valves, in reference to quantity of steam to be admitted, and time of action, both in opening and shutting, to the necessities of the piston's motion, are more under the control of the engine driver, and the engine's own motion.

The shortness of and enlargement of the induction steam pipe to a point—all the way from the boiler—near the steam chest, always with a supply of steam; the engine losing little power by that horse-leech wire-drawing of steam in the supply pipe.

The employment of a very simple but very effective means of preventing the piston rod from carrying air into the cylinder during its in-motion.

Superior methods of clothing the several the several parts of the engine containing steam to prevent loss of power by radiation of heat. I mention this because a Cornish engineer takes more pains with this perfecting of detail than any other kind of engineer thinks it worth while.

The extent to which the principle of expansion is carried, and adapting the variation of expansion to different speeds, effective powers, &c., under which the engine may be worked, also the conveniencies of the adjustable valve gear.

The position and peculiarities of the condensing apparatus in the designing and arranging of which a Cornish engineer displays not a little engineering skill, aad in the managing of which a tact only to be acquired by long-continued contact with, and strict attention to its sensitive and subtle performances, a knowledge of which, applied to practice, can alone secure the economical results from this portion of steam action, or, I should rather say, the getting quit of its re-action, and that of those parasite gases (so to speak) which sap the virtue of atmospheric pressure.

These are some of the causes why a Cornish engine is better than the other more common variety, and they are real causes, embodying the secret of success of the engine's performances. Touching upon the question of fuel, there are peculiarities of furnace and boiler construction, and attendance of fires in the Cornish practice alike contributive of economy. J. West, of the Norris Works, Norristown, Pa., is an excellent and thorough bred Cornish Engineer. JOHN H. COOPER.

486 North 6th st., Philadelphia, Pa., January 1856.

[In the communication of H. Haines, page 147, on the third line above the last, for the words "effect radiation," read "prevent radiation." The foregoing letter corroborates the inferences of Mr. Haines.

Steel Corked Horse Shoes.

MESSRS. EDITORS—I noticed in your paper of the 19th inst. the description of an improvement in Spring Heel Horse Shoes. I offer the following as a substitute:—

After the shoe is "turned" in the ordinary way, let the heel be split a little beyond the point where the angle is formed in turning down the cork, (say an inch and a half,) then take a plate of cast steel about 1-12 of an inch thick, corresponding in width with that of the heel of the shoe; lay it in and mold it firmly. Then turn and sharpen the cork in the common way, then harden or temper the steel by heating and cooling, so as to render the steel as hard as it can be made. Here you have a cork that will remain sharp till it is worn out, and needs no setting or sharpening so long as the shoe remains tight. I have been in the habit of having my horses shod in this manner for the last three winters without having them set for the purpose of sharpening from the time they were put on till spring. The smith charges me $4·50 for shoeing the span in this manner. A. FOSTER.

Dayton, Mich., Jan. 23, 1856.

The Greatest Bridge in the World.

The people of Canada are gifted with no mean ideas relating to "the future progress and greatness of their country." The Britannia Tubular Bridge, in England, is justly considered to be the greatest engineering work of huge building in the world; but the Canadians have the courage to engage in building a bridge over the St. Lawrence, at Montreal, which, when completed, will completely dwarf the now famous Tubular Bridge referred to. We do not know if they will be able to carry out their designs, but judging from an article on the subject in the Canadian *Railway Guide*, which contains the report of Robert Stephenson and A. M. Ross on the subject, we believe they will make a bold attempt to execute them, at a cost of $7,000,000. This bridge is designed to be composed of huge wrought-iron tubes, like the Britannia Bridge, and the works to carry out the plan was commenced in 1854, some of which are already completed, such as approaches on the north side, 1344 feet; approaches on south side, 1033 feet, and two abutments, 484 feet. These are completed in a most permanent manner. The stone work is massive, and bids defiance to the largest masses of ice that are to be found floating in the St. Lawrence.

The masonry of the bridge piers, 24 in number, range from 40 to 72 feet in hight. The total length of this gigantic structure will be 9,439 feet, viz.: approaches 2377, abutments 484, tubular railway bridge 6578. The number of arches or openings by which the river will be spanned is 26. The iron tubing is to be 22 feet deep in the center, and gradually inclining towards the ends, one in every 30 feet, so that at each end it will be about 17 feet high. The center opening, which is the channel course, will be 350 feet wide, and each of the other openings 242 feet wide. The tube will be 60 feet above summer water level at the center, 37 feet at the abutments, and 16 feet wide. The weight of the wrought-iron tubing through which the railway will pass is estimated at 11,000 tuns, and the masonry will contain upwards of 28,000,000 cubic feet. It was designed by Robert Stephenson, and is now being carried out under the superintendence of Alexander M. Ross, the engineer of the company. The contractors are the celebrated firm of Messrs. Peto, Brassey, Betts & Jackson, England.

The great expense of such a bridge has led a number of those interested in the grand Trunk Railroad to suggest a suspension bridge in place of the tubing, as its cost would be far less—only about $1,000,000—but R. Stephenson objects to a suspension bridge as being too weak a structure, and unsuited to the position it would have to occupy. We understand that not a few engineering errors have been committed already in building the approaches to this bridge, and this has caused some dissatisfaction with the plan of the work itself. We hope, however, that nothing will prevent the complete execution of this gigantic enterprise. Science has its poetry, and great works of engineering are its Epics.

Machine for Weaving Wire.

The accompanying engravings illustrate an invention for weaving wire of all descriptions, for which a patent was granted to Mr. George W. Smith, of Mauch Chunk, Pa., Dec. 25th, 1855.

This invention consists chiefly in certain means of crimping the wire while in the loom, and during the process of weaving, whereby wire of any size may be woven without previous preparation. Similar letters on both figures refer to the same parts.

The working parts of the loom are all carried by a strong frame, represented by A A, B B, C C, and D D. The warp wires, *a a*, are secured in a traveling carriage, E E, which rests on the longitudinal timbers of the frame, and is provided on each side with a toothed rack, *b*, shown dotted in fig. 1. This rack gears with a toothed pinion, *c*, by means of which it is moved. The warp wires may be of unlimited length. At the commencement of the weaving their front ends are attached to a bar, *d*, which is held by two hooks, *e*, in the screw clamps, *f f*, at the front end of carriage E E. The warp wires are also secured at the rear end of the carriage, all in a screw clamp, *g g*, and each is further secured by a separate pair of tongs, *h'*, which grasp it close behind the clamp, *g g*. The lower portion of the clamp *g g*, contains two female screws to receive two male screws, *h*, which fit to turn easily without moving longitudinally, in a standard, *i*, attached to the carriage, E E. These screws serve to keep the warp at a proper tension, and also to let out sufficient wire, by moving the clamp, *g g*, after every crimping and filling operation, to be taken up by the next crimping operation. The screws may be operated for the latter purpose by suitable gearing or by the hand of an attendant.

The shed is opened by two sets of heddles, G G, which are attached to endless bands, *i*, passing over rollers, *j*, on a rack shaft, H, at the top of the loom, and under rollers, below. These heddles work on guides, *c' c'*, on the framing.

The reed, I, of the loom, is substantially like that of other looms, but instead of being attached to a vibratory lay, it is secured in a carriage, I', which works on horizontal fixed guides, I'', and instead of having a direct movement back and forth to beat up the filling wires, *v v*, it has two distinct movements, first advancing a short distance, after the filling wire is put in, to lay the latter square with the warp, and to bring it to a proper position for crimping, then retreating while the crimping mechanism operates on the filling wire, after which operation it advances again far enough to beat the filling wire up to its place, and finally retreating all the way back at one movement. The forward movements of the reed carriage or lay, I', are produced by two cams, J'' J'', of similar shape on a shaft, J, near the front of the loom, acting upon two elbow levers, J2 J2, which work on fixed pins, *l l*, and are connected by rods, J''', with the lay, and the backward movements are effected by two other cams, K', on a shaft, K, near the other end of the loom acting on two levers, K'', which work on fixed fulcra, *l'*, and are connected by rods, K''', with the lay. The cams, K', are of such form that when they draw back the lay after its first advance, they hold it back long enough for the crimpers to operate before it makes its second advance to beat up the filling. The filling wires, if heavy wire is used, are all previously cut to the proper length, in which state they may be inserted into the open shed in front of the reed, either by the hand of an attendant or by suitable mechanical means, the insertion always being made after every second retreat of the lay, that is to say, after it returns from beating up the filling. In fig. 1 the lay and reed are shown in the position they occupy on their first advance to square the filling, and bring it into the position to be operated upon by the crimpers. If light wire is used, the filling may be put in by a flying shuttle.

The crimpers, whose form is best shown in fig. 2, consist of two bars or plates, *m m'*, of steel, one having a face of the form the upper sides of the filling wires are required to have after the weaving, and the other a face to correspond with the form required for the lower sides, and having recesses, 5 5, therein of sufficient size to receive the warp wires at their points of intersection with the filling. They are secured by screwing, keying, or otherwise, in cast-iron stocks, L L', the former above and the latter below the warp, the former stock being attached to a pair of long arms, M M, attached to a rock shaft, M*, and the latter to a pair of arms, M' M', attached to a rock shaft, M*'. The above arms have a proper movement to open the crimpers to allow the reed to pass between or through them, and to close the crimpers upon the wires to crimp them. The opening movement of the lower arms, M', being in a downward direction is produced by gravitation, but the corresponding movement of the upper arms, M, being in an upward direction is produced by a cam, N', on a rotary shaft, N, acting on a lever, N'', attached to a rock shaft, N''', the said lever connecting with the arms, M, by a rod, *n*. The closing movement of the lower arms, M', is produced by roller cams, O' O', or revolving arms carrying rollers, secured on a rotary shaft, O, and the corresponding movement of the upper arms, M, is produced by similar roller cams, P P, on the shaft, N, the said roller cams also producing the necessary pressure for the crimping operation. The necessary crimped form of the warp is produced by the filling wires during the act of crimping the latter. In order to adapt the crimpers exactly to the thickness of the wire, the stock, L', is made in two parts, the upper part to which the crimper is secured, being adjustable relatively to the other by screws, *q q*. For different sized meshes different crimpers are used, and any number of pairs of crimpers can be provided for every loom.

In the woven fabric, where any one of the filling wires passes under a wire of the warp, the next filling wire on either side must pass under the same wire of the warp, this brings the elevations in the crimping of one filling wire opposite the depressions in the crimping

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of the next, and consequently the pair of crimpers when in position for crimping one wire, are not in position to crimp the next. To correct this, the crimpers receive a movement laterally to the warp, between every two successive filling and crimping operations, the extent of such movement being equal to the distances between the warp wires. To effect this lateral movement, the shafts, N‴, M*, and M*', are all fitted so as to be capable of sliding in their respective bearings, and the shafts, N‴ and M*, are connected to an upright rod, *p*, outside the framing of the loom, and the shaft, M*' is connected by an arm, *r*, with a parallel shaft, Q, below it, the said parallel shaft being connected with the aforesaid rod, *p*, so that by a movement of the said rod, *p*, all the above-named shafts will move longitudinally simultaneously, and with them the arms carrying the crimpers. The movement of the rod, *p*, for the above purpose is produced by a cam on a shaft, R, which makes one revolution for every two filling operations. The said cam consisting of two segments, S S', curved in opposite directions from the plane of rotation. These segments act alternately upon the upper end of a lever, *t*, which works laterally to the loom on a fixed fulcrum, *t'*, and has its lower end connected with the arm, *u'*, of an upright shaft, *u*, on the opposite side of which are forked arms, *u''*, which take hold of the rod, *p*.—The segments, S', of the cam drives the upper end of the lever, *t*, out from the loom, throwing the lower end of the same and the arm, *u'*, of the upright shaft in towards the loom, throwing out the arms, *u''*, and the rod, *p*, and moving the crimpers towards the right hand of fig. 2.

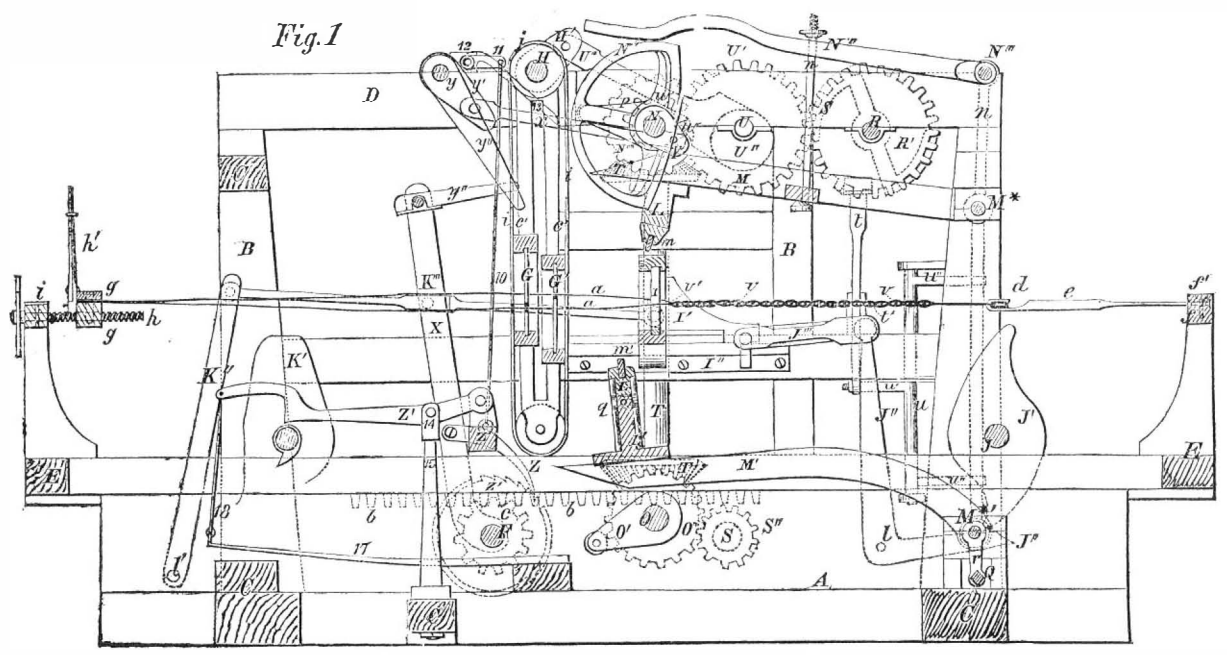
The power to drive the several parts of the loom is received by a short driving shaft, S. This shaft carries a small spur wheel, S'', dotted in fig. 1, which gears with a spur wheel (not shown) on the shaft, *o*, by which the lower crimper is operated. The shaft, *o*, also carries a bevel wheel, *o'''*, which gears with a bevel wheel, T', of similar size on an upright shaft, T, which is geared by a pair of bevel wheels, T'' N'''', of equal size with the shaft, N, by which the upper crimper is operated. The shaft, *o*, is also geared by bevel gearing, which is partly shown at U U, in fig. 2, with both the shafts, J and K, which drive the lay, the said shafts both making the same number of revolutions as the shaft, *o*. The shaft, N, carries a small spur wheel, *w*, which gears with and drives a spur wheel, U', on a shaft, U, and this wheel, U', gears with a wheel, R', of the same size on the shaft, R, and this drives the mechanism by which the lateral movement of the crimpers is produced. The shaft, U, carries an eccentric, U'', which is shown by a dotted circle in fig. 1, which eccentric is for the purpose of operating the heddles, G G', the rod, U''', of the said eccentric being connected with an arm, H', on the rock shaft, H, and thus produces the necessary movement. The shaft, N, also carries a crank. This crank, Y, drives the shaft F, from which the warp carriage, E E, receives motion. It is connected by a rod, *x*, with an arm, *y'*, on a shaft, *y*, which carries two other arms, *y''*, connecting with two long levers, X, which work on the shaft, F, as a fulcrum, and carry each a pawl, Z, which engages with one of two ratchet wheels, Z', which are fast on the shaft, F. Every revolution of the shaft, N, acting through the above mechanism, causes the shaft, F, to receive a movement sufficient for the pinions, *c*, and racks, *b*, to move the carriage, E E, a distance equal to the desired distance between the filling wires. In order to enable the warp carriage to be run back when desirable or necessary, the pawls, Z, are connected by rods, 10, with arms, 11, on a shaft, 12, at the top of the loom, and the shaft is furnished with a lever handle, 13, for the purpose of raising the pawls from the ratchet wheels.

The warp carriage is held firm in its place during the operation of beating up the filling wires by means of a clamp, *z*, which reaches all across the carriage, and presses it down on its bed. This clamp, *z*, is attached to one end of a lever, which works on a stationary fulcrum, 14, in a standard, 15, the other end of the said lever being raised by a cam on the shaft, K, and by that means being caused to force down the clamp. The clamp is raised after the cam passes the lever, by means of a spring, 17, connected with the lever by a rod, 18.

Having described the several parts of the machine and their duties and individual operations, we will briefly describe the weaving process. The warp wire having been secured in the carriage before described, the pawls, Z, are thrown in gear and motion is communicated to the driving shaft to start again. When the lay is thrown back ready for its preparatory and least forward advance, the shed is open and filling wire is put in. The preparatory advance of the lay brings this wire to the position shown at *v'*, in fig. 1, ready to be operated upon by the crimpers, at the same time laying it parallel with the face of the reed or square with the warp. As the lay retreats the crimpers commence closing, and after its retreat has terminated, the lay remains stationary long enough for the crimpers to finish their operation and commence their opening. The final and most forward advance of the lay then takes place, the lay passing right through the open crimpers and beating the crimped wire up to its proper place. The forward movement of the warp carriage takes place during the final retreat of the lay or the early part of its next preparatory advance. The slacking of the warp wires by the screws, *h*, takes place during the final retreat or at an early stage of the preparatory advance of the lay. The lateral movement of the crimpers takes place during the final advance and retreat of the lay, so that when the crimpers close upon the next filling wire which is inserted and brought to the position of *v'*, they crimp it to form precisely the reverse of the last, that is to say, with its depressions opposite the elevations of the former one, and *vice versa*. The operation proceeds as above till the carriage has been driven up as far as convenient, when the loom is stopped, and the clamps, *f f*, and the tongs, *h'*, are unfastened, and the whole of the warp is pulled forward in the carriage, E E, by the attendants, or by

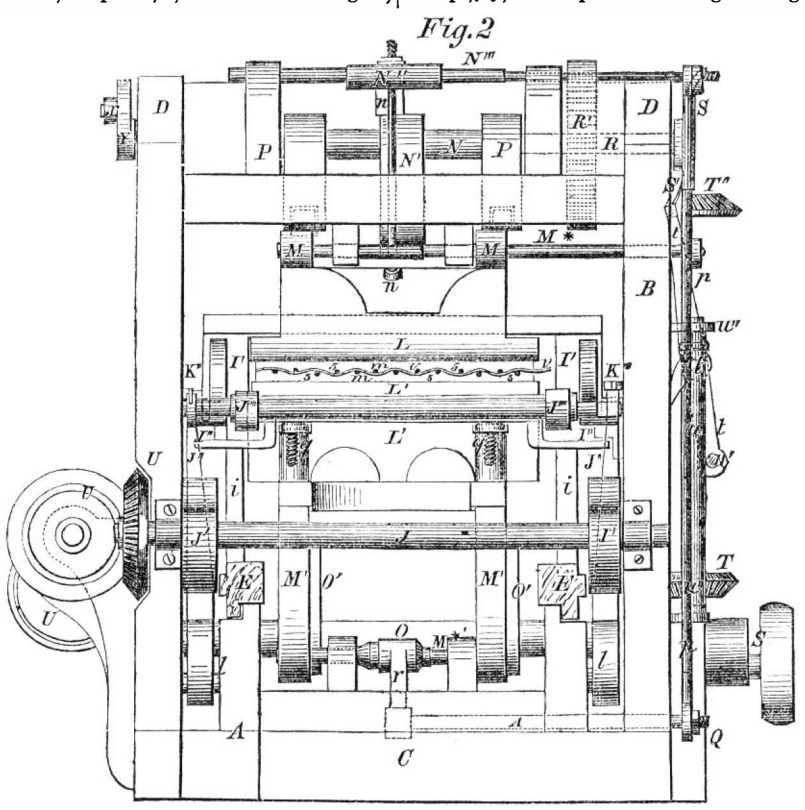
MACHINE FOR WEAVING WIRE.

Fig. 1



suitable mechanism, the clamps, *g g*, admitting of this drawing forward, as they only grasp it just tight enough to keep the wires properly extended and straight. The work is then again secured, the front part being secured this time by clamping it directly between the clamps, *f f*, the hooks, *e e*, being no longer necessary, and the rear part being secured by the tongs, *h'*, as before. When all is secure, the pawls, Z, are thrown out of gear, and the carriage, E, pushed back by the attendants to such a position as to bring the last filling wire at a proper distance from the lay, after which the pawls may be thrown in gear again and the loom started, when all will proceed as before till the warp carriage has again run up as far as it can, and the warp requires to be moved and the carriage run back. The fabric may be cut after being drawn past the clamps, *f f*, or if required to be of great length

Fig. 2



it may be wound up into a roll. There is no limit to the length that may be woven, as the warp wires may be joined.

We are informed that a weaving machine constructed as above may be operated more rapidly and with less expense that others in use. It will also produce work of a very superior quality. We regard the invention as one of importance, and advise all who are interested in good improvements to give it a careful examination. Address the inventor for further information.

Chicago Sewers.

An elaborate and interesting report on this subject has been presented to the City Council of Chicago, by the Board of Sewerage Commissioners of that place. It appears that three principal plans were proposed for the drainage of the city. These were first to drain the sewers into the river, and its branches directly and thence into the lake; second, into artificial reservoirs, to be thence pumped up and used as manure; and third, into the river at the city, and thence by the proposed steamboat canal into the Illinois river. The board adopted the first-named plan, which to drain into the river and branches directly and thence into the lake, the reasons in its favor being that it would allow the sewers to be constructed in such a manner as to take the utmost advantage of the natural facilities that the site of the city affords, and consequently that the sewerage may be less in extent and cost.

Meteorological Observations.

An arrangement has been entered into between Professor Henry, of the Smithsonian Institution, and Judge Mason, U. S. Commissioner of Patents, by which the system of meteorological observations, heretofore conducted by the Institution, will be hereafter executed under the direction of the Patent Office. In pursuance of this change, the Commissioner has issued a circular, directing attention to the severe storm of snow, hail, and rain, which extended itself over a large portion of the Union, from the 4th to the 6th of last month, and asking for information in regard to it.

Great Iron Manufactory.

The St. Louis *Republican* states that the American Iron Mountain Company have their furnace at the Iron Mountain in blast, producing an average yield of seventeen tuns per day, and some days as high as 18 tuns of No. 1 foundry metal, blown with hot blast. The hight of the furnace is 38 1-2 feet, 9 feet diameter of bosh, and 3 feet funnel head. This great yield is attributable alone to the superior quality of ore, which yields about 56 per cent., consumes about 120 bushels of coal per tun of metal, and about eight per cent of limestone.

A Broad-Cast Sower Wanted.

MESSRS. EDITORS—I wish some of the inventors would perfect a good broad-cast sower for grain and grass seed, light, simple, and cheap, so that some of us who have been carrying from one-half to three-fourths of a bushel of wheat over our fields for thirty years, while sowing, may ride in some light sulkey or carriage the rest of our lives, and see horse power perform what we feel we have done too long. Drills do not answer among our sweet potato vines, nor for clover, &c., in the spring.

Woodbury, N. J., Jan. 1856. J. T.

The French *metre*, which has become the key to mensuration on the continent of Europe is equal to 3·2809 English feet.

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Scientific American.

NEW-YORK, FEBRUARY 9, 1856.

American Climatology.

A recent number of the New York *Tribune* contains an interesting article on the above-named subject. The main idea which the author endeavors to present is the dependence of a country for its agricultural products on the quantity of its rains. The amount which falls annually in different parts of our country is given, and the fertility of the Mississippi valley —where no less than sixty inches fall—is described correctly. The causes of those rains, however, and of their unequal distribution over our continent, are not mentioned.

A country without rain, unless it possesses some compensating substitute, must be a barren waste. A plant cannot grow without water, any more than a human being can live without it. Egypt is, indeed, "a land without rain," but its well-known fertility is due to the river Nile, which regularly overflows its banks and saturates the soil, and affords it at all times a supply for artificial irrigation. Rains are produced by evaporation from large bodies of water—seas and lakes. The atmosphere which holds the vapor in suspension is drifted towards mountains, where it is condensed, and then becoming heavier than the air, it falls down in showers to cheer the thirsty ground. Cold atmospheric currents, when they meet warm moist currents, also act the part of condensers to produce rain. The winds of a country, therefore, have much to do with its climatology.

The geographical features of North America exercise a marked influence in the atmospheric disturbances which takes place in various parts of it. The Appalachian range of mountains—3000 feet high—running parallel with the Atlantic from Maine to Alabama, give a peculiarity of climate to the country east of them, from that which lies west—the vast valley of the Mississippi. This great basin is bounded on the west by the Rocky Mountain range, which has an average elevation of 10,000 feet, stretching from the Arctic regions to the Isthmus of Panama, and it has a gentle descent from the northern lakes to the Gulf of Mexico, where it opens its arms to the warm moist winds of the Carribean Sea. These warm breezes, freighted with moisture, flow up, and are confined in the valley, where they are expressed by a cold upper current from the west, and drop down in fertilizing showers on the land beneath. This is the reason why so much rain falls in the Mississippi valley, and it is, and always will be a land of great fertility.

A cold upper west wind flows steadily across the Rocky Mountains and towards the east. This current, owing to the geographical features of our country, is nearly a due west wind in the Southern States, while it forms the piercing north-west wind of the Eastern States and Canada. It was the cause of the severe cold which lately prevailed over such an extent of territory, and explains the reason why the cold visited our Western States before it was felt in the east. The exceeding coldness of this wind arises from its being robbed of the moisture it carries from the Pacific Ocean as it crosses the Rocky Mountains, and this furnishes a solution of the cause of those large rainless tracks on this side of these mountains. A vast quantity of rain falls in Oregon, by these west winds leaving their moisture behind them on that side of the mountains, just as the "Ghauts" of Madras express the moisture from certain sea winds, making them pour down rains on their one side, clothing all nature with the richest fruitage, while on their other side rain seldom falls, and as a consequence, vast tracks become barren wastes there.

The Mississippi valley seems to be formed by nature to be the granary of the world. Its soil is of unequalled richness, and its clouds drop down fatness—there is no other country equal to it. The future of this great valley—the richest on the globe in fuel and fruitage—who can contemplate without being deeply impressed with visions of unrivalled power, greatness and wealth?

Fire Proof Floors.

A great number of fires take place in all our cities; by these much valuable property of all kinds is consumed annually, and a dead loss of real wealth is thereby caused to our country. Great quantities of grain, cotton, and merchandize is often destroyed in stores having good fire-proof walls and roofs, but which have timber floors. When a fire breaks out in one of such stores or warehouses, it cannot well be confined to the department in which it originates, but spreads throughout the entire building, and destroys everything from the lowest story to the roof.

We believe that every room and every story in city buildings of all kinds, ought to be fire-proof, and the time will yet come when this will be the case. We use too much wood in our buildings, and for common and cheap houses we will have to do this for many years to come, but when we see a large new store in the course of erection, witness its thick fire-proof walls, and then see its floors (as we often do) made of the most combustible materials, we cannot but conclude that some person is responsible for want of wisdom and forethought in designing and erecting it. Every store and building containing valuable property should be so built, that if a fire were to break out in any apartment it might be confined there. Fire-proof floors are necessary to effect this. Why, therefore are not all our stores built with rolled iron or other incombustible floors, so as to render them fire-proof. Some, we know, are thus built, but not many. We look upon the French as a volatile people, but nearly every house in Paris is fire-proof, and in this respect the French exhibit more forethought than we do. Let our people see to it that they put up fire-proof floors, as well as walls, in all new buildings designed to contain valuable property.

Steamboats.

FIRES—From the annual report of the Supervising Inspectors of steamboats, we learn that no less than nineteen steamboats were burned last year, involving an estimated loss of $1,105,500. Such a destruction of valuable property is a great loss to our country.

Every means should be adopted to prevent the fires, because such a loss as that mentioned is equal to the labor of 1515 men at $2 per day, for 365 days,—a vast amount of labor; and what is wealth but the fruits of labor?

The steamer *Herald* took fire in Chesapeake Bay, when the engineer immediately opened the steam valve for letting the steam into the hold, then set the fire pumps to work and extinguished it in a few minutes.

Just before the passage of the Steamboat Law, the steamboat *Columbus* took fire in the Chesapeake Bay, and by not having fire pumps it was entirely consumed. The good service done by the fire pumps, which the new law compels boats to have, is gratifying, still the loss from fires given above is so great, that we hope the Inspectors will hereafter exercise as severe a scrutiny into the safety of boats from fires, as from explosions. A positive fire-proof paint for wood work is something yet to be discovered; a solution of lime, glue, and alum, or common salt, is that recommended in the Report; it is a very good composition. An improvement in its use, we would add, is to employ the glue and lime in one solution, then before it is quite dry, wash it over with a strong solution of alum and the sulphate of copper.

INFLATED LIFE PRESERVERS UNSAFE—The Inspectors condemn the use of inflated life preservers for steamboats, because they are stated to be unreliable. The steamer *Bulletin*, which was destroyed last March, by fire at Tompkins Bend, involving a loss of the boat, 3,500 bales of cotton and 23 lives, was provided with inflated life preservers, which proved to be entirely useless. When new life preservers are required on any boat, the local Inspectors are not to pass any of the inflated kind.

Cheap Sewing Machines.

Some few weeks since, in noticing the sales of a number of valuable patents, we alluded among others to a ten dollar sewing machine, and distinctly stated that the machines were being manufactured by Messrs. Jerome & Co., Co., New Haven, Conn. We were very particular to give the address of the parties in order to save our readers the trouble of sending to us for information. There appears to be an extraordinary demand for the invention, and we have been flooded, greatly to our annoyance, with letters and inquiries relative to the same. We have concluded that we will not be annoyed any longer. We repeat the address of the makers for the benefit of all those who want the machines or information respecting them, and hereby give notice that we shall consume no more time, paper, or postage money, in replying to letters upon the subject.

Copper and its Uses.

This ancient metal—named *Cuprum*, from the Isle of Cyprus, where it was once obtained in considerable quantities—exists native in the metallic state, as an oxyd, chloride, carbonate, sulphuret, arseniate, and phosphate. The metal is obtained abundantly from the sulphuret ores, by roasting and repeated smeltings. In color it is ruddy; it is malleable, fusible at a yellow heat (about 1996,) and it boils and volatilizes at a white heat; and burns in oxygen gas with a green flame. It was the principal metal used by the ancients for armor, instruments of war, and domestic utensils before the discovery of malleable iron. It has great tenacity, and can be beaten into thin leaves, or drawn out into fine wire. It oxydizes slightly in a moist atmosphere, and becomes covered with a thin green crust, after which it is almost proof against the action of the weather, hence it makes the most durable covering for houses, and were sheet copper as cheap as tin plate, it would be used exclusively for roofing purposes.

The World's theater for smelting copper ores is the valley of Swansea, in the Bay of Bristol, England. The smelting foundries in that place are seventeen in number, and to them nearly all the copper ores raised in England, Wales, Scotland, Ireland, Australia, Chili, Mexico, Cuba, New Zealand, aud many parts of the United States—yea the whole world—are brought to be smelted. The ores are purchased by agents of the works, who are very skillful in determining their quality. Anthracite coal mixed with one-fourth of its weight of bituminous, is the fuel used for smelting, and about 750,000 tuns of it are consumed annually at Swansea. The ores are reduced in reverberatory furnaces, which are kept in full blast day and night, and never suffered to cool. The workmen, or smelters, have a somewhat terrible life of it, owing to the deleterious gases—arsenious, sulphurous, copper, &c.—which impregnate the atmosphere when they are drawing their charges. The sulphur expelled into the atmosphere from the ores smelted in Swansea, amounts to 188 tuns per day. The country around gives sad evidence of their deleterious effects. They are continually rising in thick white clouds, which, when condensed, drop down and injure vegetation, and give to the very sheep and cattle in the neighborhood peculiar diseases. Various plans have been tried to render the copper ore smoke innocuous, such as tall chimneys, and the showering of the gases with water where they escaped. Tall chimneys did not effect the object, and the showering plan was found too expensive. As the business prosperity of the place is dependent on the copper works, the inhabitants put up with the evils attending them.

From the rough ore, until the copper comes forth cast into malleable ingots, it undergoes no less than ten different smelting operations, all of which are troublesome, expensive, and unhealthy; and require great skill and care on the part of the superintendents and workmen. It would naturally be inferred that if great deposits of metallic copper existed anywhere, that the expensive and troublesome smelting of ores at Swansea and all other places would cease; but such an inference has not yet been found by experience to be correct. In the Lake Superior region there are immense beds of the metal, and yet we have been told that copper can be obtained cheaper from some ores by smelting, than the pure copper can be mined. It is said that the expense of cutting and blasting it exceeds the cost of smelting the ore, which is easily mined. This to us appears almost apocraphal. If the expense of mining the metal is really greater than smelting the ore, it appears to us that the copper regions of Lake Superior present a fine field for the exercise of the inventive genius of our country, in devising improved plans for facilitating cheap mining. Last year, a single copper foundry in Swansea produced, from ores, 6250 tuns of saleable copper, or about double the quantity of copper mined in all the Lake Superior region. It is our opinion, however, that America will yet throw England all into the shade in the production of metallic copper. As the metal can be obtained in our country in exhaustless quantities, we cannot but believe, it will yet be mined much cheaper than it can be smelted from the ores. Copper is extensively used for making large kettles or pans for many purposes, such as distilling various kinds of spirits, boiling sugar cane juices, dyeing silk, cotton, and woolen goods, in processes where acids are employed. It is also used in sheets for sheathing ships, to prevent the attack of barnacles; and although yellow metal or brass is also much used for this purpose, because it is cheaper at first, we believe that copper is cheapest in the end, because the yellow metal is liable to become rotten (the best term we can use) in a few years, when exposed to salt water. For worm-tubes, to boil liquids by steam, copper is superior to iron, and is almost exclusively used for this purpose. Copper rollers are employed for printing calicoes. The pattern can be partly engraved and partly rolled in with steel dies, or it can be electro-plated. Copper is used in strips to make the patterns on blocks for hand calico printing—a very intricate and peculiar art.—It is used in engraved plates for printing, an art now practiced to but a limited extent in comparison to what it was a half century ago. All electrotype plates are deposits of pure copper, from solutions. The impressions which present the ideas embraced in this article to the reader's mind, were produced by copper deposited on the face of common type. Many boilers for steamships were at one time made of copper. It was believed they could generate more steam from the same quantity of coal than iron boilers; but the latter have entirely superseded them. Iron tubes, for boilers, are also superseding copper and brass ones.

"Copper-smithing" is a peculiar art, because the metal has many peculiarities, which must be known to the artizan, or he cannot manage it. It is tempered by the very process that softens steel, and *vice versa*. Most of the craft-knowledge is hid in the workshop, and has never appeared in print. Tubal-Cain, more than five thousand years ago, no doubt knew many things concerning this metal, of which the compilers of modern encyclopedias appear to be profoundly ignorant.

[Concluded next week.]

Recent American Patents.

Improved Method of Painting Window Shades —By D. Lloyd, of New York City—Readers are doubtless familiar with the method employed by merchants and others for marking boxes, called stenciling. The stencil plate consists of a very thin sheet of metal with letters cut out. The plate is laid upon the box, and a brush, wetted with paint or ink, is passed over the same. The ink passes through the apertures, and the box cover is thus neatly printed, in accordance with the lettering of the stencil plate.

The present improvement consists in an adaptation of the stenciling process to the production of ornamental window shades or curtains. By the employment of different colored inks and numerous stencil plates, it is said that very beautiful pictures and figures can be produced.

Universal Joint.—By Jonas Hinkley, of Huron, O.—The inventor provides each end of the shaft with a hub, through which passes a pin; each pin is provided with a peculiar shaped frame, and these are so united as to leave a certain degree of play, and thus communicate rotary motion from one shaft to the other.

Improved Pinch Bar—By Henry N. DeGraw, of Orangetown, N. Y.—This is a railroad contrivance intended for use in and about locomotive stations. It is often necessary to move a locomotive for a short distance when there is no steam up. This is generally done by means of a crow bar, or more properly a pinch bar. If the track does not happen to be perfectly level, great care must be taken to wedge the wheels, otherwise the locomotive will be likely

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to go, *nolens volens*, in the wrong direction.—The present improvement consists in the application to the pinch bar of a sort of spring wedge, so arranged that the moment the locomotive wheel moves, the wedge springs under and holds the same, thus preventing any back action.

Improved Flock Cutting Machine.—By J. N. Pitts, of Blackstone, Mass.—Certain kinds of wall paper used in dwellings are furnished with raised ornamental figures, which have a beautiful velvety appearance and touch. This is called "flock paper." It is made by dusting over the figures, after printing, and while the ink is fresh, with woolen dust. The dust is thus glued to the figure, and feels, beneath the finger, somewhat like velvet. Flock dust is made by cutting up bits of cloth into minute pieces. Any desired color may be imparted to it by dyeing. Printers use flock dust in the production of ornamental placards. It has a very beautiful effect.

The improvement above noted consists of a large drum, within which two cutting cylinders, having knives upon them, rotate. The stuff to be reduced into flock being thrown into the drum will be continually carried around and dropped between the cutting cylinders, until, at last, it is sufficiently fine for use. This is a very excellent invention for the purpose. It was illustrated on page 84, Vol. IX. of our paper. It may be used for cutting up rags in paper making.

Recent Foreign Inventions.

Girder Rail—W. B. Adams, C. E., of London, has obtained a patent for a new rail which has been tested on the Great North-Western Railroad, over which a heavy coal traffic passes. The rail is similar to the ordinary one, but 2 in. deeper, being 7 instead of 5 in. deep. There is a flange at top and bottom, and on each side angle brackets, one side of which fills up the space between the flanges secured to the rail by bolts, the other extends outwards, forming a sort of longitudinal shelf at each side, level with the ballast, so that when packed all that is seen is 2 1-2 in. rising above the brackets. These form a secure bearing of 13 inches wide. The ballast is packed from each side, and thus secures the permanent way. The gauge is kept correct by the rods, about 9 feet apart, no wooden sleepers are employed, and the entire rails and appendages, consisting of rails, brackets, bolts, and tie bars, are of wrought iron; the whole, when complete, forms one compact mass.—This rail is expensive at first, but is said to be the cheapest in the end, as it endures longer than the common kind, and requires less attention for repairing, &c.

New Paper Materials—J. Pechlgris de Frontin, of Agen, France, has obtained a patent for making paper from the stalks of the artichoke and the stalks of the sunflower. They are said to make a beautiful quality of paper.

A New Ether Engine—Henri G. Pecoul, C. E., Paris, has obtained a patent for generating power in steam engines, by passing steam from the boiler through spiral copper tubes, which converts ether in a cylinder into vapor, and it then actuates the piston to give it motion. We have seen some statements in our foreign exchanges, to the effect that a company in France formed to test Du Tremblay's steam and ether engines—and who have had some ships propelled by such engines running between Marseilles and the Crimea last year—have paid a dividend of 40 per cent on the original stock. Such immense profits as these are stated to be, afford good grounds for suspicion regarding their truthfulness.

New Textile Fabric—R. Mulligan, of York, England, has obtained a patent for making a cloth or fabric which has the appearance of being partly crape and partly Orleans cloth. To effect this, the warp of the fabric is made of worsted or other suitable yarn, and a weft of woolen yarn used for some parts, and of worsted yarn for other parts, the different qualities of weft producing a different cloth in the same web. A great variety of fabrics may thus be produced in one web of cloth, for skirts of ladies' dresses, &c., by the use of alpacca, mohair, silk, and other weft. Our manufacturers may improve on this hint.

New Burning Fluid—G. H. Wilson, of London, has obtained a patent for a combined fluid to be used for artificial illumination, composed of glycerine and alcohol. Mr. Wilson read a paper on the uses of glycerine before the late meeting of the British Scientific Association. He is Superintendent, we believe, of Price's celebrated candle and soap works in London.

Traveling Wrapper for Personal Wear—A patent has been taken out by Phillip Levy, of Edinburgh, for a wrapper for traveling in cold and stormy weather, which is intended to protect the feet, legs, and body as far up as the waist. The inventor describes it as follows:

"I construct a sack or bag which extend upwards at the back, in such a manner that when the feet and legs are inserted therein it shall come up to the thigh of the wearer, but I construct it upwards in front to come to the waist, while the sides, which are not united at back further up than the thighs, wrap round the loins and back; I make these wrappers of warm woolen material, and line them with fur or other soft warm substances."

The patent for this garment cost the inventor four times more than a United States patent would have cost an American inventor, and yet we have no doubt but he has found it a profitable security. In our country such garments are more necessary than in England, and yet, we doubt if any of our furriers would have taken out a patent for a like invention. Any improvement, however small, in the line of business in which a person is engaged, and which he can manufacture, always pays handsomely for the securing of it by patent. In England they know, by long experience, the value of patents, hence, although they (patents) are more expensive there than here, as many, if not more, are secured weekly. Many men have made fortunes by obtaining patents for such improvements on articles as others would have overlooked or neglected to secure.

The Woodworth Patent Extension.

Messrs. Editors—The remonstrance against the Woodworth Patent is still progressing.—There seems to be an interest awakened against the monopoly tantamount to the odiousness of the opposition. The outrageous demands of the Woodworth party is meeting with their desert as far as St. Louis is concerned. What are other places doing. J. J. S.

St. Louis, Mo., Jan. 24, 1856.

Our correspondent also sends us an extract from a St. Louis paper, which reads as follows:

"*Down With the Woodworth Monopoly*—Petitions of remonstrance against any further extension of the 'Woodworth Patent for Planing Machines,' by Congress, may be found at the office of the Missouri Planing Mill, corner of Walnut and Ninth sts.; at Moies & Co.'s, No. 16 Main street; at Hunt and Wiseman's hardware store, Third street, and at R. M. Parks & Co.'s office, corner of Washington avenue and Seventh street, St. Louis, Mo.

All interested in dethroning this 'hydra-headed monster,' are requested to leave their autographs at any of the above places."

We are pleased to observe that the people of St. Louis are waking up to action on this great subject. The same spirit is manifest in other sections of the country, but in still others, there is a listlessness and langor which is not only discreditable but unfortunate. Every branch of mechanical and agricultural industry will be more or less affected favorably by the prevention of the extension scheme. Farmers, mechanics, and people of every class, do you want the price of lumber, with which you build and repair your houses, your ships, your vehicles, your tools and implements of all descriptions, reduced? If so, then try to prevent the extension of the Woodworth Patent. In buying dressed lumber you now pay a heavy tax, amounting in the aggregate to several millions of dollars annually, to one of the greatest monopolies that ever existed. Do you want to continue or abolish that tax? If you wish it abolished, then sign your name to the remonstrance against the extension outrage.

The Woodworth Patent Extension.

Messrs. Editors—The remonstrance against any further extension of the Woodworth Patent Planing Machine, by Congress, is being largely subscribed to here. Signatures are obtained without a dissenting voice, excepting from one or two parties who are interested in the extension being granted—being owners of the patent now, and having the prospect of retaining the same for another term, should that be obtained. I confess I was not prepared to believe that such vast measures would be resorted to as are being used in the acquiring of influence and means to accomplish the continuance of so ultra a monopoly.

I have ascertained, by the admission of parties concerned, that an agent or representative of the Woodworth Patent interest, was in this place a short time ago, and conferred with the owners of the right here, soliciting their support and influence to get the extension granted, under a guarantee that they should hold the extension for the next term on very easy and reasonable terms; hence retaining an influence which would otherwise have been powerful against them. This being the case here, is no doubt the case every where, throughout the Union, wherever the machines are used or rights owned. Hence you will perceive that every owner of the Woodworth Patent is being a party *to*, and has a direct interest *in* the extension.

Thus a vast array of influence and interest is presented before Congress, from all parts of the Union; and unless a powerful counter influence is exerted, will no doubt *tell* to the accomplisment of their schemes.

Had these measures not been adopted, those owning the patent, in their respective localities, throughout the Union, would have been doubly interested in putting down the monopoly. For having their mills in operation, and their business established, they have little to fear in respect to growing competition. While, on the other hand, should the extension be granted, they would be subject to contend for the right against the capitalist, who, seeing the advantages arising from its protection for another term of seven years, would bid largely for the prize; henec the present owners would be compelled to pay exhorbitant prizes or lose their business, and their machines rendered useless to them.

I have also been informed, through a gentleman from Ohio, who is largely interested in both the Woodworth and Norcross patents, that in Ohio the Woodworth party have petitioned the Legislature to recommend, through their Representatives in Congress, a further extension of the patent. Thus not only is there an individual, but a legislative influence brought to bear in favor of their avaricious and unprincipled demands.

Can it be possible, after having reaped a more than bountiful reward, from the liberal protection of our patent laws, to their fullest extent, and a still further bounty from Congress, by which they have become immensely wealthy, that they should seek to usurp the rights of the public, and to avert the just intent of our liberal patent laws? Has individual honor no moral power to incite to honesty and justice in this respect, or has honor and honesty been made subservient only to avarice? It would seem so, or such measures as those above alluded to, would never have been used.

J. J. S.

St. Louis, Mo.

Brief History of Guano.

The London *Farmer's Magazine* furnishes the following comprehensive history of Guano:—"Guano, as most people understand, is imported from the islands of the Pacific—mostly of the Chincha group, off the coast of Peru, and under the dominion of that government Its sale is made a monopoly, and the avails, to a great extent, go to pay the British holders of Peruvian government bonds, giving them, to all intents and purposes, a lien upon the profits of a treasure intrinsically more valuable than the gold mines of California. There are deposits of this unsurpassed fertilizer in some places to the depth of sixty or seventy feet, and over large extents of surface.

The Guano fields are generally conceded to be the excrement of aquatic fowls, which live and nestle in great numbers around the islands. They seem designed by nature to rescue, at least in part, that untold amount of fertilizing material which every river and brook is rolling into the sea. The wash of alluvial soils, the floating refuse of the field and forest, and, above all, the wasted materials of great cities are constantly being carried by the tidal currents out to sea. These, to a certain extent at least, go to nourish, directly or indirectly, submarine vegetable and animal life, which in turn goes to feed the birds, which in our day are brought away by the shipload from the Chincha Islands.

The bird is a beautifully-arranged chemical laboratory, fitted up to perform a single operation, viz.: to take the fish as food, burn out the carbon by means of its respiratory functions, and deposit the remainder in the shape of an incomparable fertilizer. But how many ages have these depositions of seventy feet in thickness been accumulating?

That a little bird, whose individual existence is as nothing, should in its united action produce the means of bringing back to an active fertility whole provinces of waste and barren lands, is one of a thousand facts to show how apparently insignificant agencies in the economy of nature produce momentous results."

Great Bronze Casting.

The Springfield *Republican* gives an interesting account of the casting of the parts of the great bronze equestrian statue of Washington, at Ames Foundry, in Chicopee. The statue was modeled by Mr. H. K. Brown, and is the largest of the kind in the country. The *Republican* says:—

"The immense work has been cast in fragments, and that one just finished is the largest and most difficult of the whole, namely, the entire body of the horse. As the preparation of the mold has required considerable time and great care, and as many hazards attend the execution of such a work, the hour appointed for the trial was one of no small interest to the contractors and those employed upon it.—About one hundred persons had gathered from the neighboring shops to witness the scene, wholly unprepared, however, for what followed. Soon after the hot metal began to flow into the mold it commenced spirting with great rapidity from every crevice in the mold, and in all directions. The workmen who stood upon and around it, were enveloped in a shower of liquid fire, which burned their hands and faces, and set fire to their garments, while the spectators fled in terror from the building. The foreman of the shop, Mr. Langdon, anticipating some trouble, had agreed with his workmen not to give up the object of their long endeavors if a desperate effort could save it. With courage that deserves great praise, they persevered and filled the mold, escaping with only slight injuries, We saw the monster horse, headless and limbless, lifted from his bed yesterday, and it was hailed as an entire success. The contractors may well congratulate themselves over their work, for it is the first and only achievement of the kind made in this country, and perhaps nowhere else, but in Munich, Bavaria, could so large a piece of bronze statuary be cast."

A great meteor passed over Denmark on the night of the 10th of last month. It varied at times from the size of the sun to that of a star of the first magnitude. It changed its configuration several times, having appeared now in one mass, then in two, then again in three and so forth alternately, lighting up the heavens to a considerable distance.

A mine of Epsom salts is said to have been recently discovered in Santa Cruz county, California. If it should not prove remunerating to its proprietors, it will, nevertheless, be always good for *working people*.—[Exchange.

[But how can there be Epsom salts in California? These salts are simply the sulphate of magnesia prepared at Epsom. The sulphate of magnesia is found native in South America, in various mineral springs, and may be formed direct from "bittern" sea water.

It is said that agate stones steeped in a solution of copperas for a few hours, then baked in a hot oven, acquire a fine red color.

Persons were passing on the ice, last week, between Goat Island and the Canada, above the Falls of Niagara. It is 25 years since this was done before.

A submarine telegraph has been laid down from Constantinople to Alexandria, to cross Egypt, and be hereafter extended from Suez to India.

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TO CORRESPONDENTS.

F. & P., of Mass.—We cannot spend the time to search our files for the information you want. If it is of any importance to you, we advise you to examine carefully the back volumes of the Sci. Am. You can, without doubt, find them in Boston,

C. R. Barnes, of Hebron, Wis.—Wishes to procure a machine for turning axe handles and spokes, also a machine for sawing out barrel staves.

F. C. M., of Mass,—It is not new to brake up a train of cars by forcing down the brakes by the action of the bumpers when they come together. It has often been proposed to us. Without some very convenient shifting arrangement the train cannot be backed when such brakes are used.

J. F. L., of N. Y.—Your model has arrived, and our engravers are already at work on the cut, which will appear in the paper in about three weeks.

Fisher & Agnew, of Columbia, S. C., desire to obtain the address of the owners of Leavitt's Corn and Cob Mill, patented in 1855.

Wykoff & Bro., Ripon, Wisconsin, wish to correspond with a manufacturer of door plate frames intended for glass fittings. The kind they wish particularly is a good sized silver plated frame, heavy plated glass fitted.

R. E. J., of Ala.—A lotion composed of alcohol and potash lye applied to ring-bone in a horse, and kept on it with a cloth, is stated to have cured the disease. It will do no harm to try this remedy, but you had better consult a farrier.

A. E. D., of Mo.—The magneto-electric machine has been applied to telegraphing, and also electro-plating, but it has not answered so well as the battery.

A. E. P., of N. Y.—You state that heat is an "imponderable body;" well, what is an imponderable body?

S. A. S., of Vt.—The paper for Bain's telegraph may be prepared for some hours before it is used, if it is prevented from evaporating the moisture. It is generally prepared as wanted, with a solution of the prussiate of pot ash, and a little salt and lime water.

B. W., of Miss.—Your requests to send you the Sci. Am and wait for our pay, and to publish gratuitously, "for the general benefit of our readers," your business card, which would be worth, at our rates, nearly $4 each insertion, is as cool a piece of *modesty* as we have encountered lately. There is an air of sincerity about your letter that almost leads us to suppose you are candid in the matter. Still we hope you do not consider us quite so green as to suppose we could accommodate your wishes. We are not, you may depend upon it.

Isaac Simmons, of Baltimore, Md.—Wants the best machine in use for turning spokes. Also a machine for riving staves, and a machine for cutting down standing trees Who can meet Mr. Simmon's wants.

J H., of N. J.—By addressing I. M. Singer & Co., this city, you can get the information you want about Morey & Johnson's Rotary Sewing Machine. They hold this patent by assignment.

H. G. B., of Mich.—When did that notice appear in the Sci. Am. to which you refer? If it is a long time back it would be useless to recur to it again. It is too late.

A. C. C., of Tenn.—The best coal stove for heating, now in use in this city is named "Stanley's Patent." We have one of them in our establishment. By a perfect system of ventilation, the cold air should be taken in somewhere near the roof of a room, and the warm air expelled near to or at the floor. This is Ruttan's system of heating and ventilation. This system could not be carried out in your building. The gravel wall of Mr. Fowler, we believe, stands the weather well; it is a cheap way of building houses, but we cannot say in answer to your letter, whether or not it is a "superior" mode.

C. A. H., of Pa.—The article referred to in your letter of the 18th is unknown to us.

J. W. S., of Ohio—Scott Russell's work on Steam will give you information respecting steam-drying houses. It is a London book, but may be obtained from D. Appleton, & Co., this city.

L. W., of Ct.—Our ladies have tried your invention for protecting the fore finger of the left hand from the point of the needle while sewing, and they do not speak of it in very flattering terms Think it would not be for your interest, or our own either, to publish an illustration of it

T. W. K., of Miss.—You should make application to Mr. F., at St. Louis, as he is probably the owner of the right of the stove.

L. C., of Va.—We think your piston packing is new, and that a patent might be secured on it. The valve motion is not patentable, it is but a modification of the tappet motion, which is the oldest contrivance for operating steam valves. The valves you refer to are both good,—The form represented of Murray's valve has been improved so as to be made to cut off the steam, and yet leave a free exhaust, this is done by properly regulating the widths of the parts, and of the space between them, and of the exhaust cavity in the valve.

N. N., of Ill.—We do not know the market value of husks prepared for mattrasses, but if you will write to Messrs. Mellen, Banks, and Pomeroy, No. 372 Broadway, New York, they can supply you with the information you want. They are some distance from our office, and therefore we cannot undertake to attend to it for you.

T. E. K., of Ga.—If the sediment in your steam boiler is only mud, you can easily remove it by "blowing out." Place a cock at the bottom or lower side of your steam boiler, and when the steam is up, open it two or three times every day, and all the mud will be forced out. To remove the scale from your boiler, empty it, then put a fire under it, until the metal is heated, then draw the fire, and strike the metal with a mallet. This will crack off the scale. If you cannot do this conveniently throw a few pounds of sal-ammonia into the water, which, in all likelihood, will dissolve it. There is no other remedy but to enter the boiler by the man-hole, and remove the crust with mallet and chisel.

R M. Wallace, of Germanville, S. C.—Wishes to purchase at wholesale, iron hubs for wagons, carriages, and buggies, also fellies, springs, clamps, etc. Who can supply him? Address him—not Munn & Co.

J. H. E. S., of Pa.—The best articles on the subject of "Stame" we have ever seen are those published in Vol. 5, Sci. Am., but perhaps we are prejudiced unduly in their favor.

G. E., of Wis.—Your plan for a head rest adaptable to seats of railroad cars is not new. A model of the same thing has been in our office for three or four years.

F. P. R., of Mass.—In the very letter in which you make the inquiry you state where the books may be had. Some people get into such a habit of asking questions they make themselves ridiculous.

E. G., of Ohio—Agitation of milk kept at a proper temperature is all that is necessary to produce butter.

P. C., of Ill.—Hollow grate bars for allowing a current of water to pass through for protecting them from the action of the heat are used in Dimpfel's coal burning locomotive. Hollow bars are also illustrated in Vol. 3, Sci. Am. The idea has frequently been suggested to us, No chance whatever.

J. L., of Ohio—Your letter will be noticed in a week or two.

Money received at the Scientific American Office on account of Patent Office business for the week ending Saturday, Feb. 2, 1856:—

R. G. P., of N. Y., $30; H. N. DeG., of N. Y., $27; S. H., of Ind., $30; H. & A., of Mo., $30; W. M., of N. Y., $30; J. S. & Co., of N. Y., $30; A. H. H., of N. Y., $25; O. L. R., of N. H., $15; J. A. W., of Iowa, $30; M. P., of N. Y., $55; W. & D., of N. Y., $35; J. B. E., of N. Y., $20; A. A., of Del., $10; W. W. A., of N. Y., $55; A. S., of N. Y., $150; S. P. C., of N. Y., $30; H. B., of Vt., $25; B. & S., of Pa., $30; J. F. M., of Conn., $30; J. E., of Ga., $30; E. D., of Mich., $30; J. M., of Pa., $45; C E. & C. D. A., of N. J., $60; J. D., of N. Y., $30; J. G. McM., of N. Y., $30; A. P., of N. Y., $25; G. H. W., of N. Y., $25; H. H. T., of Ill., $25; D. F. S., of Ill., $27; D'A. P., of C. W., $250; W. H. P., of N. J., $25; M. M., of R. I., 30; J. D., of Ind., $55; P. M., of Ill., $30; H. W. A., of N. Y., $15; G. & H., of N. Y.; $30; M. & B., of N. Y., $25; S. & L. of N. Y., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Feb. 2:—

W. & D., of N. Y.; A. H. H., of N. Y.; H. N, DeG., of N. Y.; A. P., of N. Y.; J. E., of Ga.; M. & B., of N. Y.; S. & L., of N. Y.; A. N., of Pa.; J. B. E., of N. Y.; J. H. of N. Y.; H. H. T., of Ill.; G. H. W., of N. Y.; D. F. S., of Ill.; H. B. S., of Vt.; B. & F., of N. Y.

Literary Notices.

The Bibliotheca Sacra—This profound theological review for this Quarter contains a great essay on "Science and the Bible," by Prof, Dana, of Yale College. It is a review of the work of Prof. Tayler Lewis, of Union College, N. Y., on the Biblical account of the Creation; the lash is laid on with no gentle hand. It endeavors to sustain the most general views of geologists regarding the *days* of creation mentioned in Genesis—that is interpreting them to mean great epochs of time. Published by F. Draper. Andover, Mass.

The Knickerbocker—The present number of "old Knick" is a capital one. It contains some good stories, poetry, and a fine account of a hunt in "John Brown's Tract," in the wilds of Northern New York, respecting which we once heard a witty orator make the remark, that "no crow ever contemplated a flight over this region without first making a will." The editor's table is, as usual, rich in wit and humor. Published by S. Huestion, 348 Broadway.

Putnam's Monthly—The leading article of this magazine for February is on "Washington in Boston," sixty six years ago. It is an interesting and graphic sketch of the visit of "the Father of his Country" to Boston in 1786. The dress and customs of the people of Boston and its vicinity are described with accuracy, and the great difference between those times and the present in New England are very great and striking. The other articles are well written. Published by Dix and Edwards, No. 320 Broadway.

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WM. BURDON'S STEAM ENGINE WORKS, 102 Front street, Brooklyn, N. Y.—Engines from 3 to 40 horse power constantly kept on hand, of the latest styles and patterns, with all the modern improvements. Engines from 40 to 200 horse power made to order, high pressure or with condensers. Also portable engines with boilers, and engines attached with wheels for pile-driving and wood-sawing, circular saw mills, upright engines that take up a very small space for printers' and pumping engines, steam pumps of various sizes, rotary pumps and mining pumps; also quartz mills and stampers for copper and gold; improved hoisting machinery for mines or stone quarries: also sugar machinery, sugar mills, sugar kettles and vacuum pans, saw mills, grist mills, marble mills, rice mills, screw and hydraulic presses, boilers, and castings of every description. The reputation that Wm. Burdon has sustained for the last 20 years, as an engine builder, is a guarantee for his work. Miners and manufacturers will find it to their advantage to patronize his establishment, as not less than one hundred finished engines are kept on hand. With the large lot of boilers, shafting, pulleys and hangers kept on hand, orders can be shipped the same day they are received. Also a large number of second hand engines of various sizes for sale. Second hand engines bought or exchanged for new ones or sold on commission. The great facilities and perfect system and order carried on in this establishment, enables Mr. Burdon to sell lower than any other establishment in the country for the same material and labor. Advice given gratis, drawings and plans made at the shortest notice. 4*

NOW READY—NEW AND VALUABLE BOOK on Engineering—"Pocket Book for Railroad and Civil Engineers," containing new, exact, and concise methods for laying out railroad curves, switches, frog angles and crossings; the staking out of work, leveling; the calculation of cuttings and embankments, earthwork, &c., by OLIVER BYRNE, Civil, Military, and Mechanical Engineer.

Extract from the Preface—"The plans and rules in this work will be found great economizers of time and labor; in this place I will only allude to, 1st, the laying out of railroad curves by ordinate tables of whole numbers. 2nd, how to drive side stakes exactly, without trial and error. 3rd, When the cross-sections of cuttings and embankments are irregular, a rule is given to find exactly the hight of equivalent level cross-sectional areas.—4th, a general earthwork table, without supposing the side slopes to meet under the center of the road. 5th, the proper coning of wheels of railroad cars, and the true rise of the outer rails on curves. 6th, calculations of cuttings and embankments. C. SHEPARD, & Co, Publisher, 152 Fulton st., New York.

N. B.—Price $1 50 and sent by mail free of postage.—The above book is got up in the most convenient style for engineers, being in tucks, and containing blank paper for drawings, with a drawing pencil attached. 1

LINEN MACHINERY—JOHN R. McNALLY' Champlain, N. Y. Agent for the sale of linen machinery of every description, new and second hand. Engineers and machinists tools, and linen yarns of every number and quality. 22 13*

STEAM ENGINE of 100-horse power for sale.—New and made by a celebrated maker.—Will be sold at a bargain for cash only. Apply to J. PECARE, 163 Hester street, New York City. 22 3*

J. HERVA JONES, Inventor of Randall & Jones' Patent Hand Planter, and proprietor of New York, Michigan, Wisconsin, Minnesota, and Northern Illinois, Superior to all. Machines and Rights for Sale. Agents wanted. Send for a circular. Rockton, Winnebago Co., Ill. 22 5*

IMPORTANT TO INVENTORS.

THE UNDERSIGNED having had Ten years' practical experience in soliciting PATENTS in this and foreign countries, beg to give notice that they continue to offer their services to all who may desire to secure Patents at home or abroad.

Over *three thousand* Letters Patent have been issued, whose papers were prepared at this Office, and on an average *fifteen*, or *one-third* of all the Patents issued each week, are on cases which are prepared at our Agency.

An able corps of Engineers, Examiners, Draughtsmen, and Specification writers are in constant employment, which renders us able to prepare applications on the shortest notice, while the experience of a long practice, and facilities which few others possess, we are able to give the most correct counsels to inventors in regard to the patentability of inventions placed before us for examination.

Private consultations respecting the patentability of inventions are held free of charge, with inventors, at our office, from 9 A. M., until 4 P. M. Parties residing at a distance are informed that it is generally unnecessary for them to incur the expense of attending in person, as all the steps necessary to secure a patent can be arranged by letter. A rough sketch and description of the improvement should be first forwarded, which we will examine and give an opinion as to patentability, without charge. Models and fees can be sent with safety from any part of the country by express. In this respect New York is more accessible than any other city in our country.

Circulars of information will be sent free of postage to any one wishing to learn the preliminary steps towards making an application.

In addition to the advantages which the long experience and great success of our firm in obtaining patents present to inventors, they are informed that all inventions patented through our establishment, are noticed, *at the proper time*, in the Scientific American. This paper is read by not less than 100,000 persons every week, and enjoys a very wide spread and substantial influence.

Most of the patents obtained by Americans in foreign countries are secured through us; while it is well known that a very large proportion of all the patents applied for in the U. S., go through our agency.

MUNN & CO.

American and Foreign Patent Attornies, 128 Fulton street, New York; 32 Essex Strand, London; 29 Boulevard St. Martin, Paris; No. 3 Rue Theresienne, Brussels.

N. AUBINS UNIVERSAL PORTABLE GAS GENERATOR—Patents granted Sept. 25, 1854, and Jan. 8, 1856 For factories, hotels, country houses, villages, &c. Warranted as more simple and economical than any other known apparatus. Cost of gas less than 1-4 of a cent per hour for each 5-foot burner. Can be managed by a house servant, as the joints are never disturbed, either for operation or cleaning, and the construction of the apparatus renders explosion impossible. A gold medal was awarded at the late Fair of the American Institute, N. Y. For works or rights under the above patents, apply to H. C. HAWLEY & CO., Albany, N. Y. 22 4*

CIRCULAR SAW MILLS—of improved construction, lever and pinion set, with guide for saws, furnished ready for the belt, with 4 feet saw $350, 4 1-2 feet saw $400, 5 feet saw $450. One man can cut easily 1000 feet inch pine boards per hour, or a 12 feet board in ten seconds. These mills make lumber at less than half the expense of the up-and-down saw. Steam Engines on iron frame, black finish, of the best quality, with pumps, heaters, fly wheel, crank shaft, pulley, governor and governor valve, sufficient to drive the circular saw mill, $450.—Engines 30-horse power, $700; 70-horse power, $900; 100-horse power, $1250; with pumps, heater, fly-wheel, pulley, crank shaft, governor, governor valve, &c., warranted perfect—on iron frame. Boilers, flue, and tubular, at reasonable prices. Shingle Sawing Machines of simple and improved set, self-feeding and self-stopping, to cut tamarack, oak, ash, or pine, into superior shingle, 600 to 1000 per hour Apply to L. A. SPALDING, Lockport, Niagara County, N. Y. 21 4

SCIENTIFIC WORKS—Published by D. Appleton & Co., 346 and 348 Broadway:—Appleton's Dictionary of Mechanics, Machines, Engine Work, and Engineering, 2 vols., 8vo. $12; Bourne's Catechism of the Steam Engine, Bourne's Treatise on the Screw Propeller, 4to. $9; Gillespie's Treatise on Surveying, 8vo. $2; Griffiths on Marine Architecture, $10; Hencks' Field Book for Railroad Engineers, $1 75; Holbyn's Dictionary of Scientific Terms, 12 mo., $1 50; Knapen's Mechanics Assistant, $1; Lyell's Principles of Geology, 1 vol. 8vo. $2 25; Lyell's Manuel of Geology, 8vo. $1 75; Overman's Metalurgy, 8vo. $5; Templeton's Mechanics, Millwright, and Engineers Pocket Companion, $1; Ure's Dictionary of Arts, Manufactures, and Mines, 2 vols, 8vo. new edition $5. D. A. & Co., have on sale all the important English Engineering Works. 20 3t

BOILERS FOR SALE—3 cylinder boilers, 44 inches diameter, 30 feet long, with two 13 inch flues, each with steam drums 36 inches diameter and 5 feet high, and cross boilers 36 inches diameter and 12 feet long, safety and check valves, all in complete working order. Also for sale a set of "Van Sickle's Patent Salamander grate bars," for furnace 5 feet by 10, new. Apply to HECKER & BROTHER, 267, Cherry st., New York. 20 4*

SCHENK MACHINERY DEPOT—No. 163 Greenwich street, New York, keeps always on hand Lathes, Planers, Drills, Steam Engines, Woodworth's Patent Planing Machines, Belting, &c., in great Variety. Tools furnished of any size, to order, and of the best quality. 20 6 A. L. ACKERMAN, Proprietor.

TECHNICAL DICTIONARY—In the English, French, and German Languages; by Messrs. TOLHAUSEN & GARDISSAL, Civil Engineers. Ready (first part,) French, English, German, price $1,31; (second part) English, French, German. price $1,50. These volumes are designed for the general use of Engineers, Artists, Manufacturers, Foremen, Artizans, in short, of all those who, in some way or other, are concerned in Arts and Manufactures. The present work is the key through which the foreign reader may penetrate into a language which he may know but imperfectly; it is the instantaneous translator of the corresponding technical term, or its equivalent, in the three great industrial languages.—For sale at the Scientific American Office.

CIRCULAR SAWS—We respectfully call the attention of manufacturers of lumber to the great improvements recently introduced in the manufacture of our Circular Saws. Being sole proprietors of Southwell's patent for grinding saws, we are enabled to grind circular saws from six inches to six feet with the greatest accuracy and precision. The impossibility of grinding a saw without leaving it uneven in thickness has always been acknowledged by practical saw makers. This causes the saw to expand as soon as it becomes slightly heated in working. When this takes place the saw loses its stiffness, and will not cut in a direct line. We will warrant our saws to be free from these defects; they are made perfectly even in thickness, or gradually increase in thickness from the edge to the center, as may be desired. As there are no thick or thin places, the friction on the surface of the saw is uniform, consequently it will remain stiff and true, and will require less set and less power. Will saw smooth, save lumber, and will not be liable to become untrue. This is the oldest establishment now in existence for the manufacture of circular saws in the United States, having been established in the year 1830. Orders received at our Warehouse, No. 48 Congress st., Boston. 12 3m* WELCH & GRIFFITHS.

PORTABLE STEAM ENGINES.—S. C. HILLS, No. 12 Platt st., N. Y., offers for sale these Engines, with Boilers, Pumps, Heaters, etc., all complete, and very compact, from 2 to 10 horse power, suitable for printers, carpenters, farmers, planters, &c. A 2 1-2 horse can be seen in store, it occupies a space 5 by 3 feet, weighs 1500 lbs., price $240; other sizes in proportion. 3 e3w

ENGINEERING.—The undersigned is prepared to furnish specifications, estimates, plans in general or detail of steamships, steamboats, propellers, high and low pressure engines, boilers and machinery of every description, Broker in steam vessels, machinery, boilers, &c. General Agent for Ashcroft's Steam and Vacuum Gauges, Allen & Noyes' Metallic Self-adjusting Conical Packing, Faber's Water Guage, Sewell's Salinometers, Dudgeon's Hydraulic Lifting Press, Roebling's Patent Wire Rope for hoisting and steering purposes, Machinery Oil of the most approved kind, etc.

CHARLES W. COPELAND,
43 eowtf Consulting Engineer, 64 Broadway.

ROCK DRILL—The American Rock Drill Co. invite attention to their superior machines, adapted for all kinds of rock work in quarries and mines and especially for artesian wells. They are simple in construction, powerful and accurate in operation, and can be run by hand, steam, or horse power. An engraving and full description appeared in No. 15 of the Scientific American. Apply to T. H. LEAVITT, Agent and Treasurer of the A. R. D. Co., No. 1 Phœnix Building, Boston, 17 3m*

TO COTTON MANUFACTURERS.—VOGT & ZOLLIKOFER, 205 Market st., Philadelphia, offer for sale at manufacturers prices, Warping Mill Hicks of 160 and 120 eyes. A liberal discount for cash will be allowed. 21 3*

VAIL'S CELEBRATED PORTABLE STEAM Engines and Saw Mills, Bogardus' Horsepowers, Smut Machines, Saw and Grist Mill irons and Gearing, Saw Gummers, Ratchet Drills, &c. Orders for light and heavy forging and castings executed with dispatch.
LOGAN & LIDGERWOOD,
13 1y* 9 Gold st., N. Y.

IMPORTANT INVENTION—Patented August 14th, 1855. "Garratt's Metal" for Journal Boxes of all kinds, It is anti-friction, absorbs the oil, not liable to break, it can be made cheaper than either brass or Babbitt metal, and after many long and severe tests, has been found to surpass all other metals ever used for the purpose, For the purchase of either State, county, or shop rights under this patent, apply to JOS. GARRATT, Senr., Madison, Indiana. 13 3m

1855-6.—WOODWORTH'S PATENT Planing, Tonguing and Grooving Machines.—The subscriber is constantly manufacturing, and has now for sale the best assortment of these unrivalled machines to be found in the United States. Prices from $85 to $1450. Rights for sale in all the unoccupied Towns in New York and Northern Pennsylvania, JOHN GIBSON, Planing Mills, Albany, N. Y. 14 3m*

DISSOLUTION.—The firm of Morse, Stansbury & Co., of New York, is dissolved under the articles of agreement, by the retiring of the undersigned, who is no longer connected with any firm in the United States. In connection with Mr. John T. Pitman, (late clerk of the U. S. Courts of Providence, R. I.,) and under the name of Stansbury & Pitman he continues the business of procuring European Patents, and negotiating their sale.
CHAS. F. STANSBURY, 67 Grace Church St.,
20 3* London, Eng.

MACHINISTS' TOOLS.—Meriden Machine Co have on hand at their New York Office, 15 Gold street, a great variety of Machinists' Tools, Hand and Power Punching Presses, Forcing Pumps, Machine Belting, &c., all of the best quality. Factory West Meriden, Conn. 17 13*

W. P. N. FITZGERALD, Counsellor at Law—late Principal Examiner in the U. S. Patent Office—has removed from Washington, D. C. to the city of New York, 271 Broadway, (corner of Chambers St.) As heretofore, his practice is confined to Patent Cases, which he will prosecute or defend, as counsel, before the Supreme and Circuit Courts of the United States, also before the Patent Office, or the Judges having jurisdiction of appeals therefrom. 11tf

OIL! OIL! OIL!—For railroads, steamers, and for machinery and burning—Pease's Improved Machinery and Burning Oil will save fifty per cent., and will not gum. This oil possesses qualities vitally essential for lubricating and burning, and found in no other oil. It is offered to the public upon the most reliable, thorough, and practical test. Our most skillful engineers and machinists pronounce it superior and cheaper than any other, and the only oil that is in all cases reliable and will not gum. The Scientific American, after several tests, pronounced it "superior to any other they have ever used for machinery." For sale only by the inventor and manufacturer.
F. S. PEASE, 61 Main st., Buffalo, N. Y.
N. B.—Reliable orders filled for any part of the United States and Europe. 19tf

75 CENTS A-YEAR—Or 16 months for $1. THE NEW YORK WEEKLY SUN is now sent to subscribers at the following very low rates, payable in advance:—One copy, 3 months, 25 cts.; 6 months, 50 cts.; 1 year, 75 cts.; 16 months, $1; 3 copies, 1 year, $2; 8 copies, $5; 13 copies, $8; 25 copies $15—with engravings.—The postage within the State is only 13 cents a year—out of the State 26 cents a-year. No traveling agents are employed. Specimen copies sent gratis. All letters should be post paid and directed to MOSES S. BEACH,
4 Sun Office, N. Y.

THE NEW YORK DAILY SUN—Is forwarded by the early mails to country subscribers at $4 per annum, or $1 per quarter, payable in advance. The postage under the present law is as follows: to any post office in the State of New York, 78 cents per year, payable quarterly in advance. Out of New York State, but within the United States, $1,56 per year, payable quarterly in advance. MOSES S. BEACH, Publisher,
4 Corner of Fulton and Nassau sts.

IMPORTANT TO ENGINEERS AND MACHINISTS—NOTICE—Those wishing to obtain the genuine articles of Metallic Oil and Grease, should send their orders direct to the manufacturer, AUGUSTUS YOCKNEY, Office 67 Exchange Place, New York. No Agents employed. 1 6m*

NORCROSS ROTARY PLANING MACHINE.—The Supreme Court of the U. S., at the Term of 1853 and 1854, having decided that the patent granted to Nicholas G. Norcross, of date Feb, 12, 1850, for a Rotary Planing Machine for Planing Boards and Planks is not an infringement of the Woodworth Patent.
Rights to use the N. G. Norcross's patented machine can be purchased on application to N. G. NORCROSS,
208 Broadway, New York.
Office for sale of rights at 208 Broadway, New York Boston, 27 State street, and Lowell, Mass, 19t

GRAIN MILLS—EDWARD HARRISON, of New Haven, Conn., has on hand for sale, and is constantly manufacturing to order, a great variety of his approved Flour and Grain Mills, including Bolting Machinery, Elevators, complete with Mills ready for use. Orders addressed as above to the patentee, who is the exclusive manufacturer, will be supplied with the latest improvements. Cut sent to applications, and all mills warranted to give satisfaction. 10tf

POWER PLANERS—Persons wanting Iron Planers of superior workmanship, and that always give satisfaction, are recommended to the New Haven Manufacturing Company, New Haven, Conn. 19 tf

ANDREWS & JESUP—Commission Merchants Cotton and Woolen Machinery, Steam Engines Machinists' Tools, Belting, &c., Importers and Dealers in Manufacturers' Articles; No 67 Pine street, N. Y. 23 1y*

NEW HAVEN MFG. CO.—Machinists' Tools, Iron Planers, Engine and Hand Lathes, Drills, Bolt Cutters, Gear Cutters, Chucks, &c., on hand and finishing. These Tools are of superior quality, and are for sale low for cash or approved paper. For cuts giving full description and prices, address, "New Haven Manufacturing Co." New Haven, Conn. 19 tf

HARRISON'S GRAIN MILLS—Latest Patent.—$1000 reward offered by the patentee for their equal. A supply constantly on hand. Liberal Commissions paid to agents. For further information address New Haven Manufacturing Co., New Haven, Conn., or to S. C. HILLS, our agent, 12 Platt street, New York. 19tf

THE EUROPEAN MINING JOURNAL, RAILway and Commercial Gazette. A weekly newspaper, forming a complete history of the Commercial and Scientific Progress of Mines and Railways, and a carefully collated Synopsis, with numerous Illustrations, of all New Inventions and Improvements in Mechanics and Civil Engineering. Office 26 Fleet street, London. Price $6,50 per annum. 36 tf

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Science and Art.

The Violet.

"The forward violet thus did I chide:
Sweet thief, whence didst thou steal thy sweet that smells,
If not from my love's breath ?"

The perfume exhaled by the *Viola odorata* is so universally admired that to speak in its favor would be more than superfluous. The demand for the essence of violets is far greater than the manufacturing perfumers are at present able to supply, and, as a consequence, it is difficult to procure the genuine article through the ordinary sources of trade.

Real violet is, however, sold by many of the retail perfumers of the West End of London, but at a price that prohibits its use except by the affluent or extravagant votaries of fashion. The true smelling principle or essential oil of violets has never yet been isolated; a very concentrated solution in alcohol impresses the olfactory nerve with the idea of the presence of hydrocyanic acid, which is, probably, a true impression. Burnett says that the plant *Viola tricolor* (heart's ease) when bruised, smells like peach kernels, and doubtless, therefore, contains prussic acid.

The flowers of the heart's ease are scentless, but the plant evidently contains a principle which, in other species of the viola is eliminated as the "sweet that smells" so beautifully alluded to by Shakspeare.

For commercial purposes, the odor of violet is procured in combination with spirit, oil, or suet, by maceration, or by *enfleurage*, the former method being principally adopted, followed by, when "essence" is required, digesting the pomade in rectified alcohol.

Good essence of violets, thus made, is of a beautiful green color, and, though of a rich deep tint, has no power to stain a white fabric, and its odor is perfectly natural.

The essence of violet, as prepared for retail sale, is thus made, according to the quality and strength of the pomade: Take from six to eight pounds of the violet pomade, chop it fine, and place it into one gallon of perfectly clean (free from fusel oil) rectified spirit, allow it to digest for three weeks or a month, then strain off the essence, and to every pint thereof add three ounces of esprit de rose; it is then fit for sale.

We have often seen displayed for sale in druggists' shops plain tincture of orris root, done up in nice bottles, with labels upon them inferring the contents to be "extract of violet;" customers once "taken in" thus, are not likely to be so a second time.

A good imitation essence of violets is best prepared thus:—

Spirituous extract of cassie pomade	1 pint.
Esprit de rose, from pomade .	1-2 pint.
Tincture of orris	1-2 pint.
Spirituous extract of tuberose pomade	1-2 pint.
Otto of almonds . . .	5 drops.

SEPTIMUS PIESSE.

A Curiosity of a Book.

The Washington *Star* states that The Smithsonian Institute has succeeded in obtaining for its library a rare and valuable book, printed in Low Dutch, and published in 1772. It contains specimens of paper from almost every species of fibrous material, and even animal substances, and has accounts of the experiments made in their manufacture. The following materials were employed, and specimens are given in the book:—Wasps' nests, saw dust, shavings, moss, sea weed, hop and grapevines, hemp, mulberries, aloe leaves, nettles, seeds, ground moss, straw, cabbage stems, turf of peat, silk plant, fir wood, Indian corn, sugar cane, leaves of horse chestnuts, tulips, linden, &c.

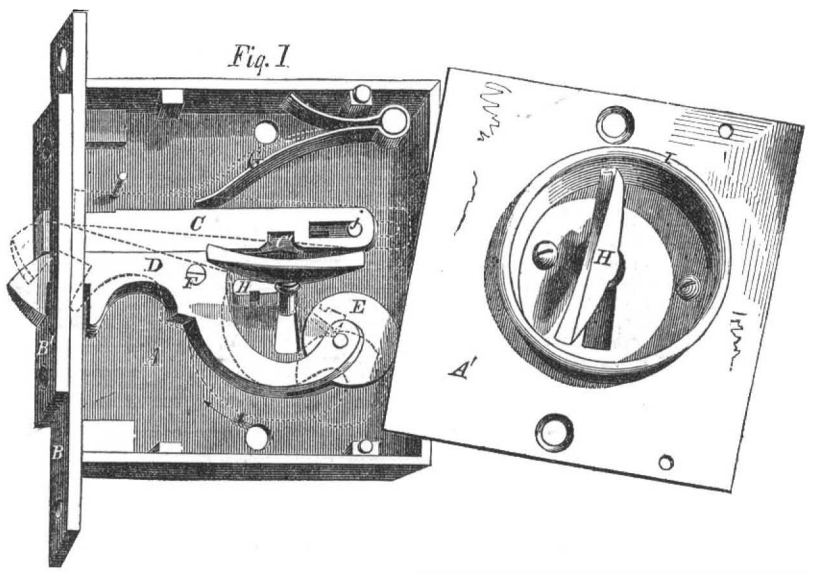
The author of the book was Jacob Christian Schaffer, an ancestor of Professor Schaffer, one of the chief examiners of the U. S. Patent Office.

Almost the Discoverer of Neptune.

During a lecture upon Astronomy delivered by Prof. Mitchell, of Cincinnati, before the Smithsonian Institute, he stated that a year or two before the discovery of the planet Neptune, he was giving his friends an opportunity to view the heavenly bodies through the telescope at the Observatory at Cincinnati. Suddenly a new object was brought within his range of observation, of a brilliant nebulous character, which he had never seen. Desirous of finding whether it was recorded in the catalogue of similar bodies, he left the instrument for a few moments, and desired his assistant to keep the telescope bearing upon it till he returned. He, however, lost the object. Prof. M. groped around for hours to discover it again, but to no purpose. After Leverier demonstrated by his profound calculations the existence of another planet, and designated the exact spot in the heavens where it could be found, Prof. M. turned his instrument to the spot, and there was his old friend, beaming and brilliant as when first he accidentally brought it within his telescopic vision. Thus narrowly did the Professor escape the fame of being the discoverer of a part of our planetary system.

IMPROVEMENT IN LATCHING LOCKS.

Fig. 1



The acompanying engravings are illustrative of the improved Latching Lock patented in this country by Mr. Edmund Field, of Greenwich, Ct., July 3rd, 1855, and in Europe April, 1855.

In common door locks, the latch and locking bolt act independently, the latch serving for convenience by day, the bolt and key for security by night.

The principal feature of novelty in the present invention consists in an ingenious method of combining the latch and lock together, so that by the act of turning the key, the latch is made to unite its strength with the bolt, and thus increase the security of the lock; when the key is turned in the reverse direction, the latch assumes its ordinary uses. These, and other important advantages shortly to be named, are obtained without any increase over the price of ordinary locks, and without complication of parts.

Fig. 2

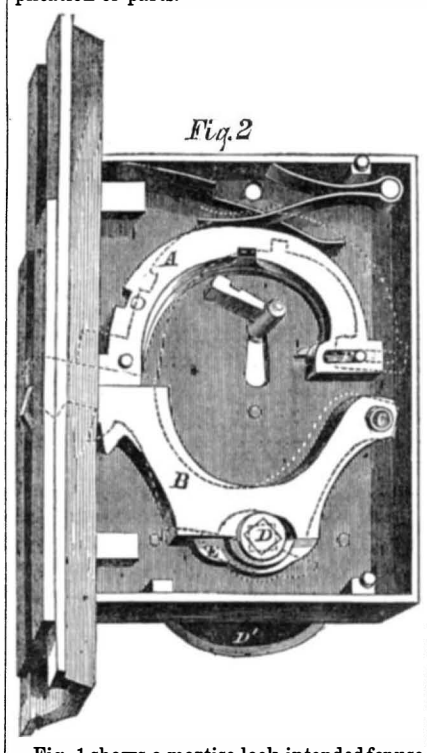


Fig. 1 shows a mortise lock, intended for use on the sliding doors of freight cars, ship doors churches, banks, arsenals, windows, and wherever a strong, safe, and convenient fastening is wanted. A is the shell of the lock, which is made in the usual manner; A' is portion of the shell removed so as to exhibit the interior parts; B face plate by which the lock is fastened into the mortise; B' catch plate to be fastened to the jamb; C locking bolt which slides in and out in the usual manner; C' tumbler behind the locking bolt; D, latch pivoted at F, and furnished at its inner end with a friction wheel, E. When the bolt, C, is locked, as shown in fig. 1, the latch, D, is fastened down, and holds firmly in catch-piece, B'. Turn key H in direction of the arrow, and bolt C withdraws, and frees the latch. The latch is operated by the key, which presses upon friction wheel, E, and lifts the latch, as shown by the dotted lines, F, the bolt, C, also lifts with the catch, the stop pin, J, serving for its pivot. There is but one spring, G, in this lock; it serves the double purpose of pressing down the bolt, latch, and the tumbler. I is a cup attached to the exterior of the lock, and intended as a shield for the key. After the lock has been placed in its mortise, a hole is bored for the cup, which is let in so as to be flush with the side of the door. The key, H, it will be observed is quite small, and does not project beyond the edge of the cup, so that the door, with the key remaining in the lock, may be shoved clear up into its recesses. One of the features of the improvemcnt consists in operating the latch by means of the key, thus dispensing with a knob; for this purpose the lock is so arranged that the key cannot drop or be taken out except when the locking bolt is thrust forward, and the latch fastened down; in other words the lock must be locked before the key can be removed.

Large heavy doors should always be made either to slide or roll, for they last longer, remain in good order, and afford better security than hinged doors; the latter will sag, sooner or later, and become inconvenient. For sliding and rolling doors of every kind, the lock we have described seems admirably adapted. The outer end of the latch is made with double shoulders, which affords additional strength.

Fig. 2 shows another form of lock, in which the same general principles are involved as those contained in the preceding device. The chief difference is that the bolt, A, and latch, B, are operated independently, although both combine, in the act of locking, to increase the security. The latch turns on the pivot, C, and is operated by the knob, D', the shaft of which D, and lifting piece, E, are arranged in the common manner. When the bolt is thrown back, the latch becomes freed, and may be lifted by turning the knob, its position when thus raised being indicated by the dotted lines; it will be seen that the lock bolt also lifts with the catch, the pin, F, serving as its pivot. Two springs are used in this lock, one of which presses on the tumbler behind the bolt, the other acting on the bolt, and the bolt pressing down the forward end of the latch. Locks of this description are intended for parlor doors.

We have described the above locks as being specially adapted to the securing of sliding doors, but they may be also applied with equal facility to hinged doors of every description. The invention appears to be one of a very excellent character, calculated to supply a very general want. For further information address the inventor, Portchester Post Office, N. Y.

Coloring of Stone.

Building stone may be tinted in different shades by impregnating it with metallic salts, and then adding a precipitating re-agent. By means of salts of lead and copper, with sulphuretted hydrogen, grays, browns, and blacks may be produced. Copper and ferrocyanide of potassium give a red tint. If porous limestones are boiled in solutions of metallic sulphates, carbonic acid is evolved, and the metallic oxyd, combined with sulphate of lime, is deeply fixed in stone. In this manner, sulphate of iron gives rusty tints, sulphate of copper a fine green, sulphate of manganese a brown, and, mixed sulphates of iron and copper, a chocolate. The double sulphates thus formed increase the hardness of stone.—[London Artizan.

Camphor Ointment for Chapped Hands.

Scrape into an earthern vessel 1 1-2 ounces of spermaceti and half an ounce of white wax; and six drachms of powdered camphor, and four table spoonsful of the best olive oil. Let it stand near the fire until it dissolves, stirring it well when liquid. Before retiring to sleep, put the ointment on the hands; also after washing them.

This is stated to be a very soothing ointment. Palm oil is equally as good, however.

Sugar from Cotton Wood Trees.

In the Utah territory there exudes from the cotton-wood trees a sweet white syrup, which coagulates into thin cakes on their trunks and branches. These are taken and washed in cold water, to free them from dirt, and are then boiled down in kettles, like cane or maple juice, and make very excellent sugar.

The Rays of the Sun and Caloric.

MESSRS. EDITORS—If the rays of the sun lose none of their caloric in passing through free space, any planet, however distant from the sun, possessing an atmosphere of equal density with ours, would be equally as warm.

WM. PARTRIDGE.

MECHANICS

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